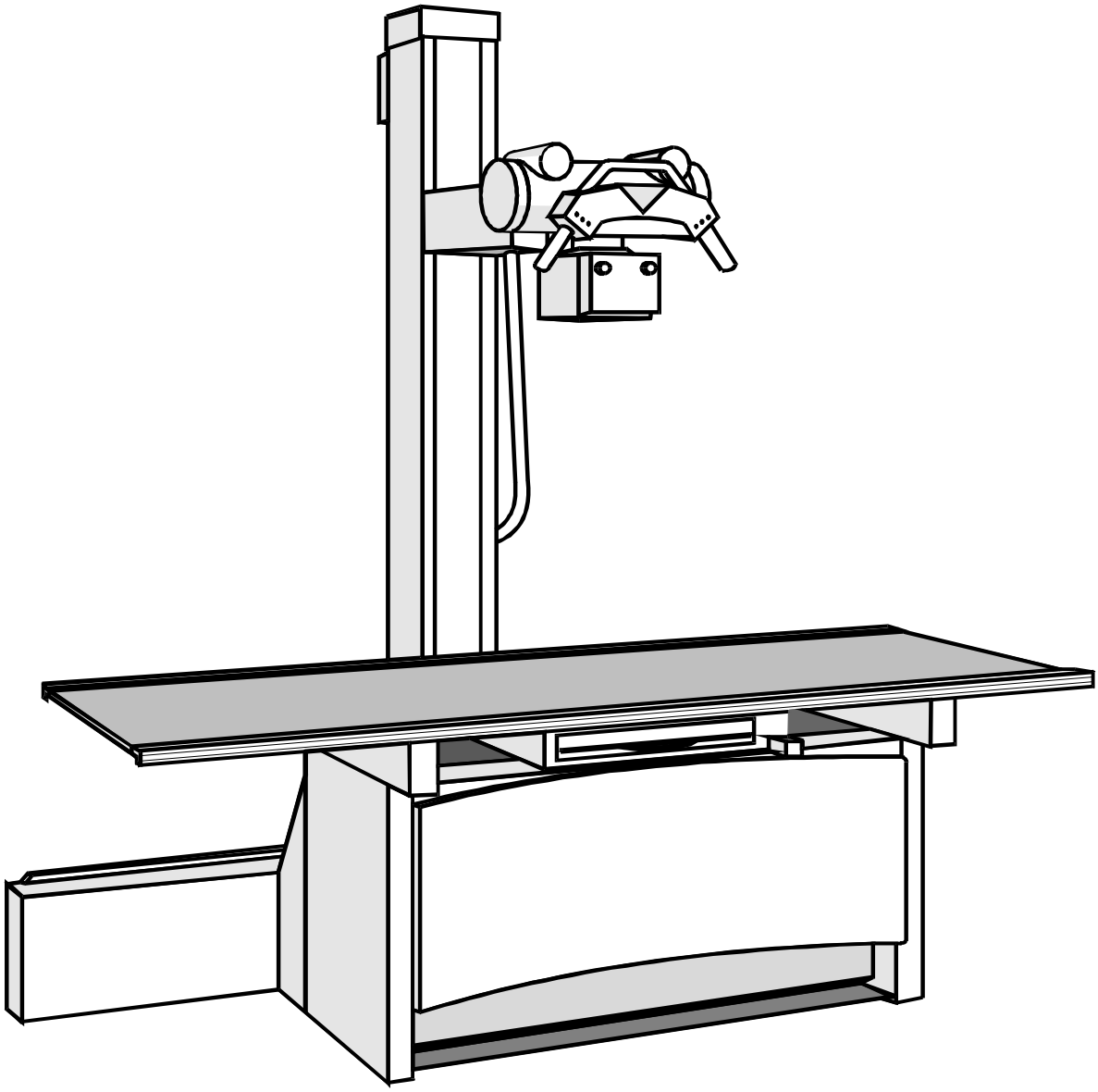
Mounting Instructions CS 2000



CE 0125

English Edition

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1. Technical data

1.1 General safety notes

In the Federal Republic of Germany, the electrical installation of rooms for medical purposes must conform to the provisions VDE Standard 0107. In all other countries the national requirements have to be observed.
Check the installation layout plan.
During the installation it is important to check that all protective ground wire connections provided by the manufacturer are properly made before the equipment is started up.
The protective ground wires between the individual system components and the power supply have to be connected as shown in the wiring diagram.
Regulation of professional associations concerning safety and accident prevention has to be observed. No work may be performed on parts carrying a voltage higher than 42 V. If it is necessary to turn on the power for execution of movements of the equipment in the course of installation procedure, it must be shut down immediately after completion of these movements.

1.2 Compatibility

This mounting instruction is valid for CS 2000 and all versions of them.
The table carries all customary in trade Bucky units.
A Bucky Wall stand can be installed on the right or left side of the table depending on the user side.

1.3 Climatic conditions

During regular work:

Temperature:	10° C to 40° C
Humidity:	20% to 80%
Air pressure:	700 hPA to 1100 hPa

During transport:

Temperature:	-25° C to 70° C
Humidity:	5% to 95%
Air pressure:	600 hPA to 100 h PA

1.4 Dimensions and weights

of components	Dimensions of components	Weights
Table	1400x770x750 mm	120 kg
Table top	2200x810x 40 mm	35 kg
Column	2320x470x302 mm	155 kg
Rail stand	2250x183x302 mm	80 kg
Tube stand with vertical carriage	600x500x200 mm	22 kg

of collies	Dimensions of collies	Weights
Table	1530x860x960 mm	155 kg
Table top	2320x930x200 mm	56 kg
Column		
Rail stand	2400x780x760 mm	330 kg
Tube stand with vertical carriage		

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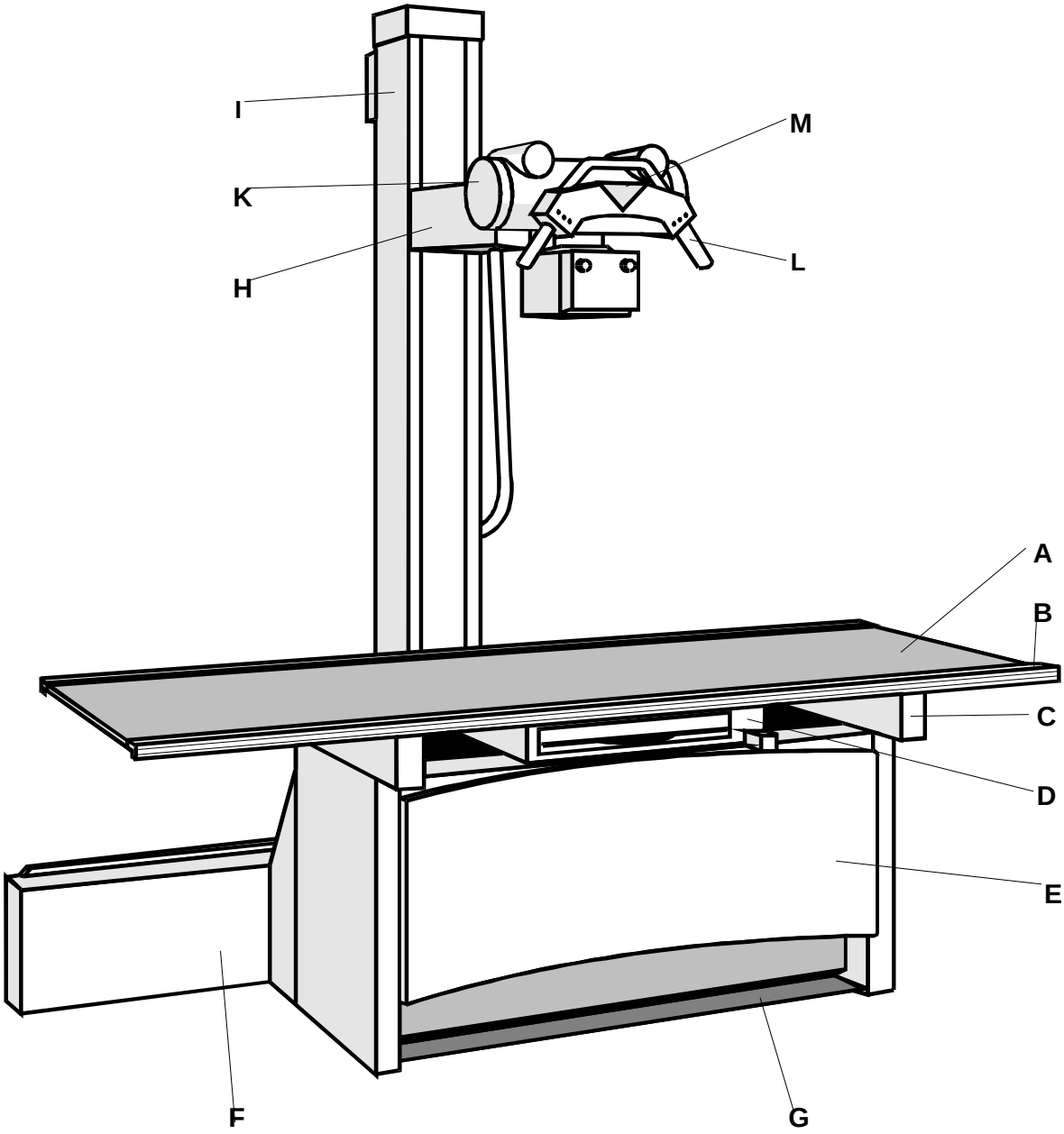
1.5 Component Designation



A Table top, floating, manually movable, scratch-proof
B Profile rail with trim cover, smooth, accepts accessories
C Upper table frame
D Bucky unit, movable
E Table base, solid, vibration-free
F Guide rails for tube stand
G Foot treadle
H Vertical carriage with X-ray tube support arm
I Tube stand, rotatable
K X-ray tube
L Control arm
M Protractor

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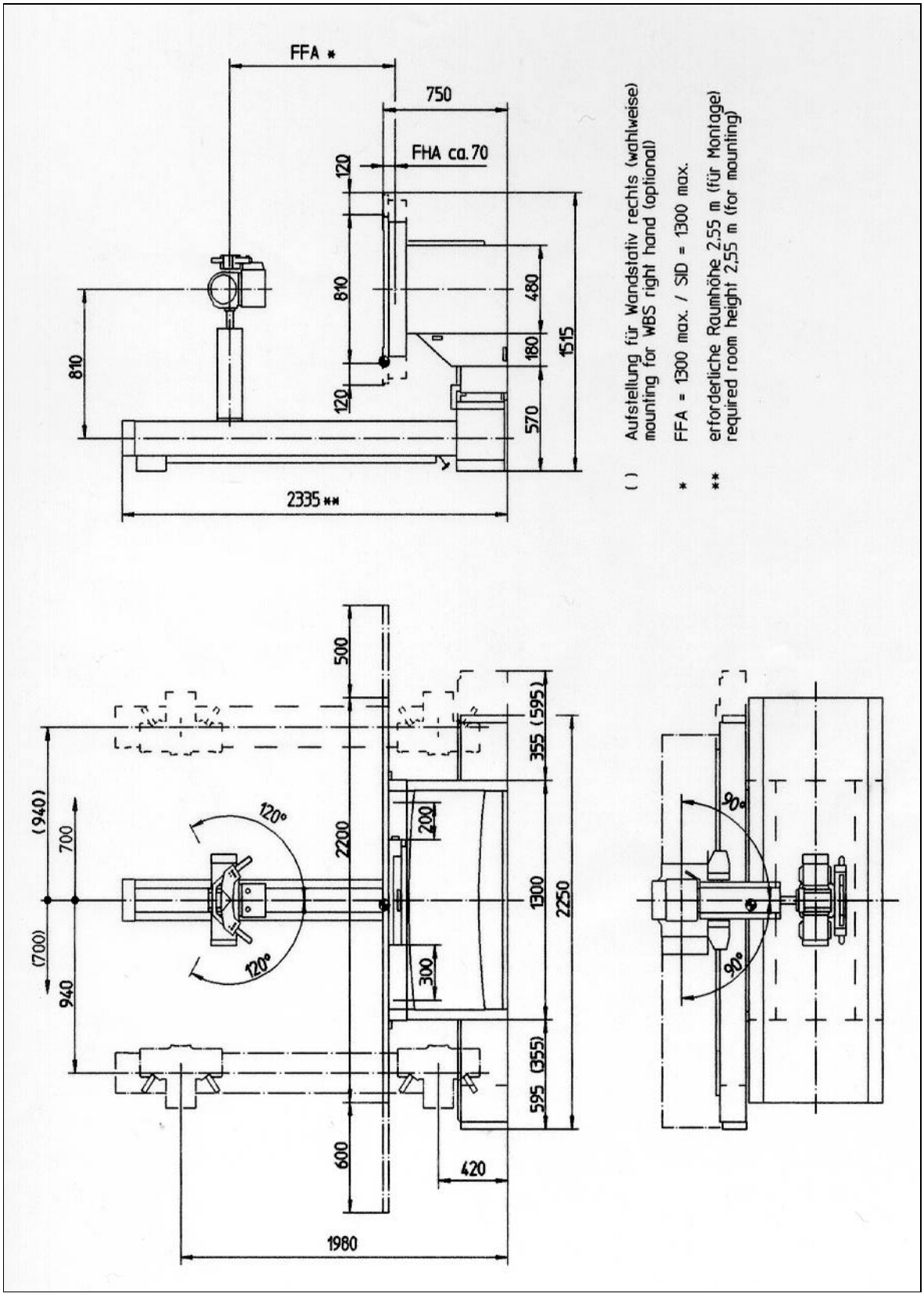
1.6 Dimensional Drawings



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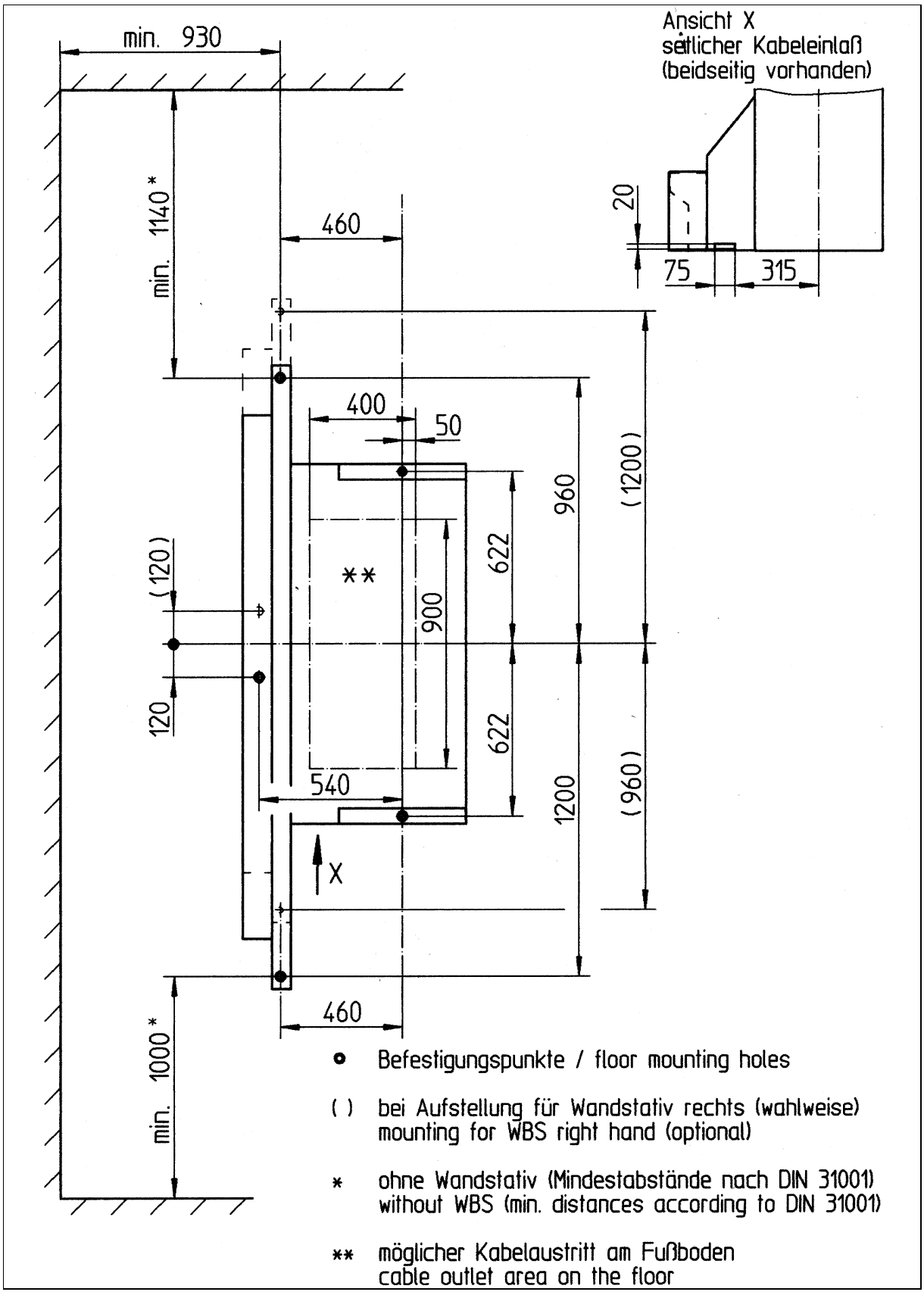
1.7 Dimensional Drawings/Floor Mounting



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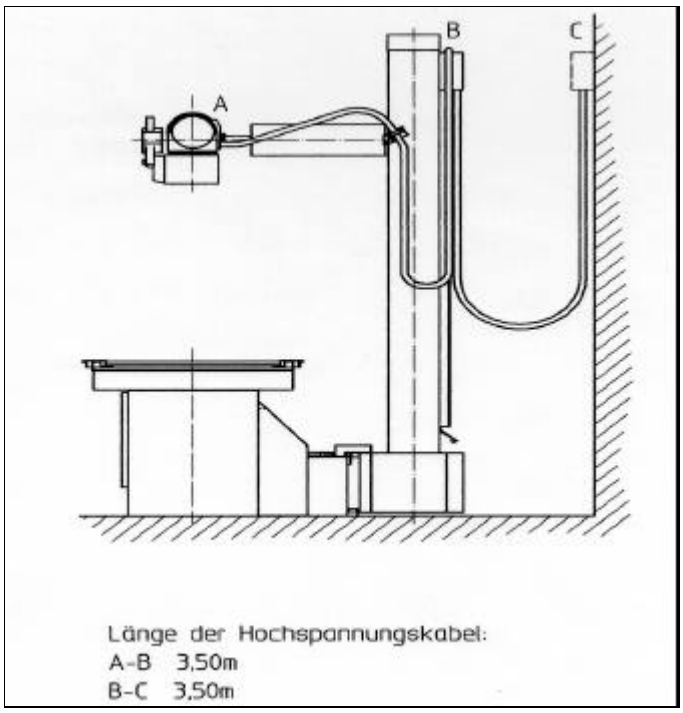
1.8 Installation of high tension cables



1.9 Constructional preparations

The electrical connection data have to correspond with the of the equipment supply voltage.
For the CS 2000 is only a supply voltage of 115/230 V required and a corresponding ground connection transmission. The mounting points of the CS 2000 have to support a tractive power of 2500 N at each mounting point (concrete floor? B 150 DIN 1045 when using the included fastening material).
Prepare on the floor fastening bore-holes of 12 mm according to drawing 1.6., under consideration of the construction.
The connection cable of the CS 2000, the Bucky and the detector has to be placed constructional depending on the version until the terminal box in the table base or until the Bucky according to the installation plan.
The optional ceiling- wall- terminal box can be mounted if required to the wall or ceiling.

1.10 Necessary measuring means

Machine air level

1.11 Necessary special tools

Percussion bore machine
Rock drill 12 mm
Socket head cap key 6 mm and 4 mm shortened (is included)

1.12 Power supply data

Power supply: 115/230 V
Frequency: 50 / 60 Hz
Rated current: 2/1 A
Rated power supply voltage: 220 VA

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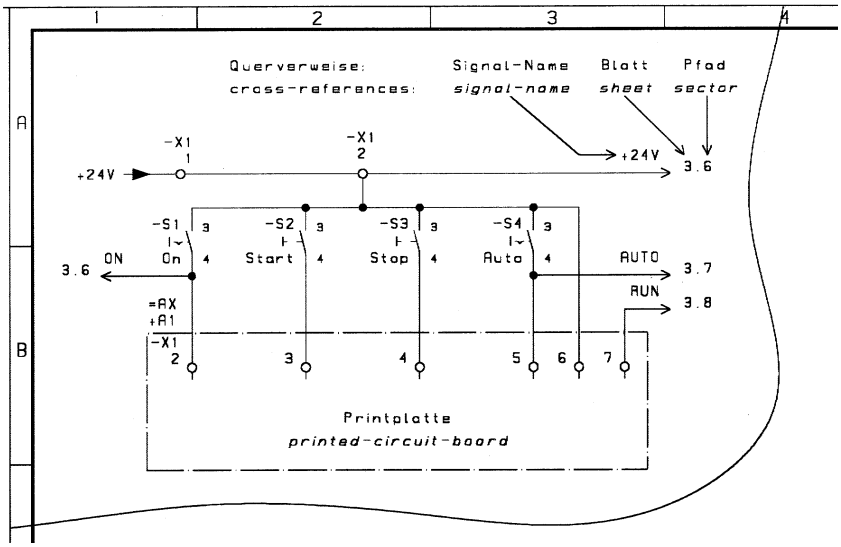
1.13 Schematics sheet 1

1.13.1 Description at Schematics

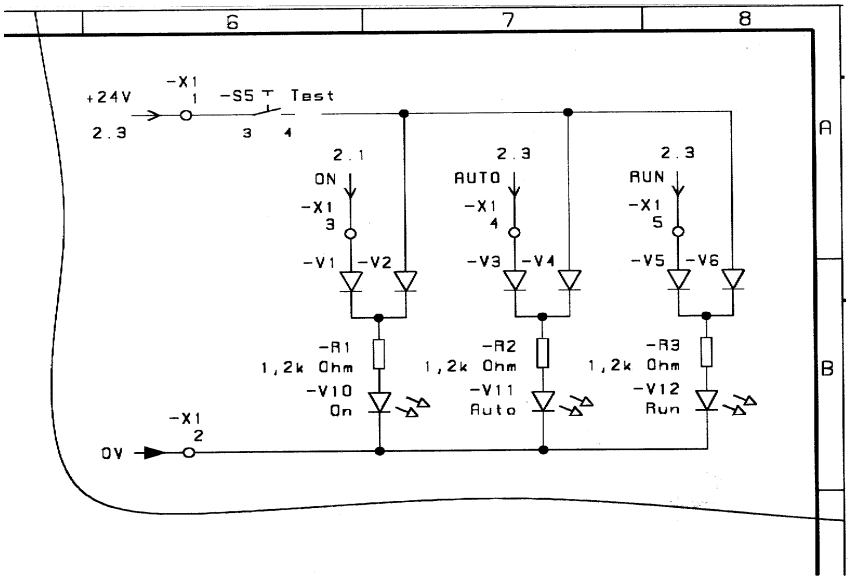
..... Schematics sheet 2

= AX control panel
= Unit, Indication



..... Schematics sheet 3

= AX control panel
= Unit, Indication



1.13.1 Table of contents at Schematics

Sheet 2	Schematics	=AA
Sheet 3	Schematics	=AB
Sheet 4	Schematics	=AB
Sheet 5	Wiring diagram	=AA
Sheet 6	Wiring diagram	=AB

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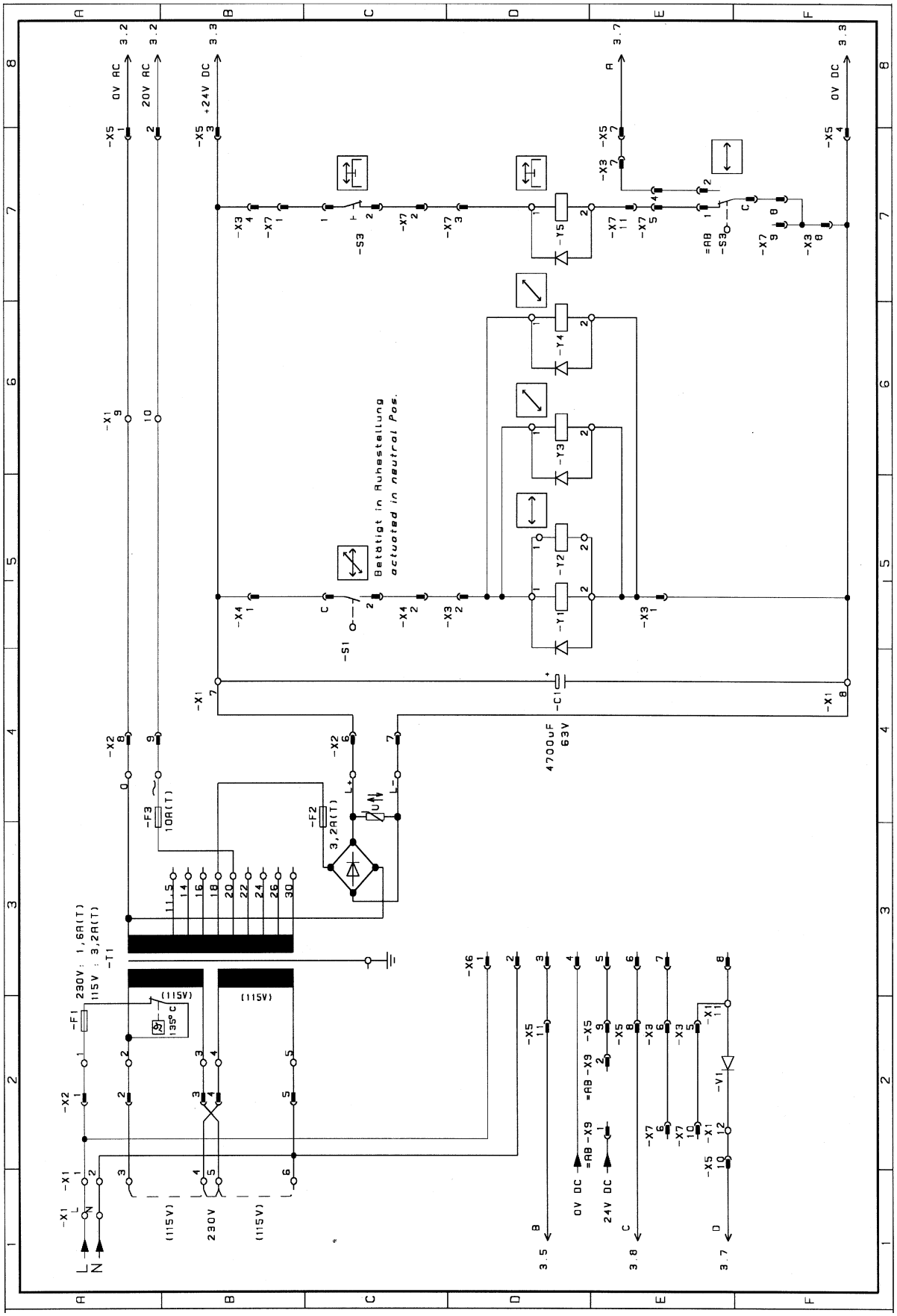
1.13 Schematics sheet 2



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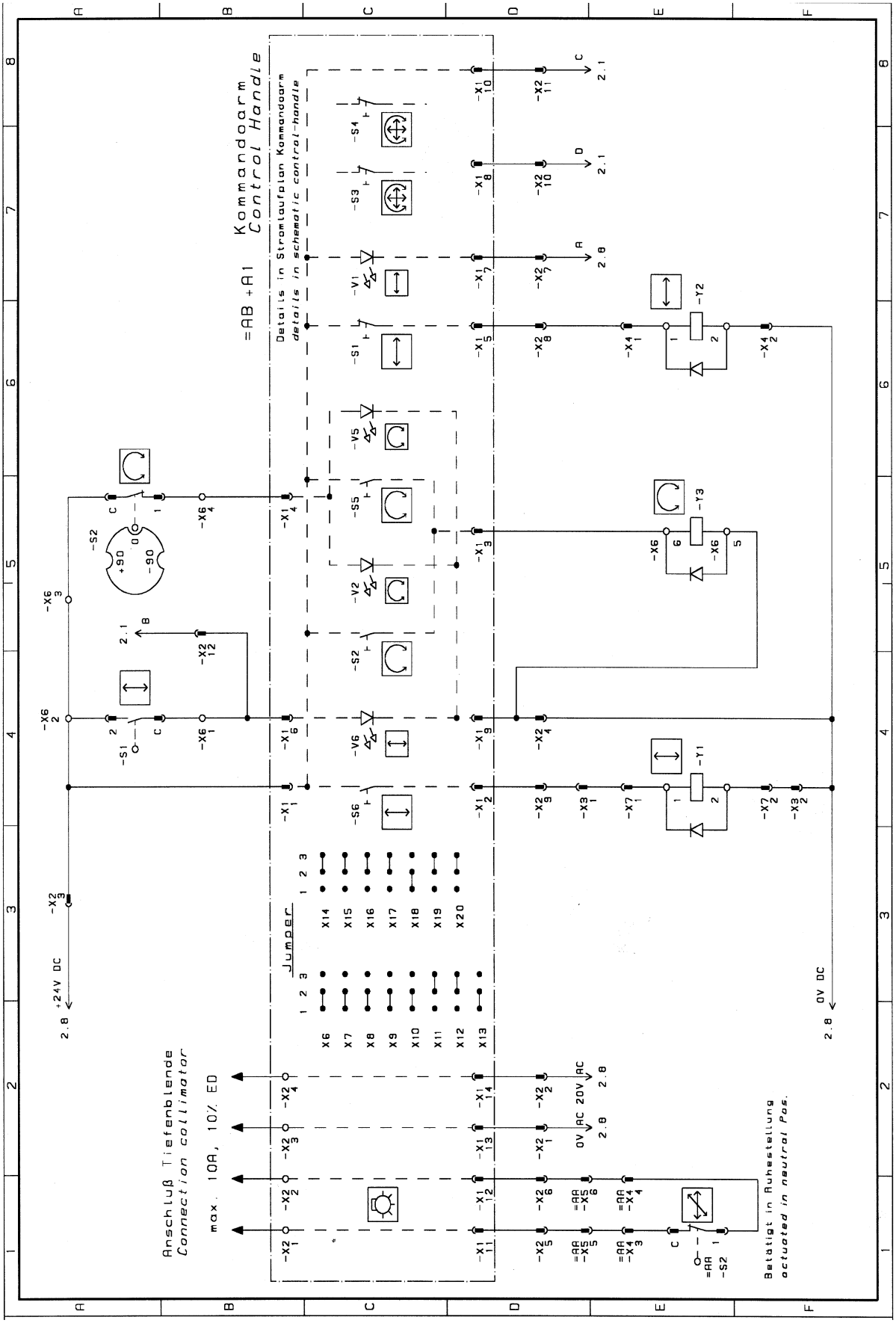
1.13 Schematics sheet 3



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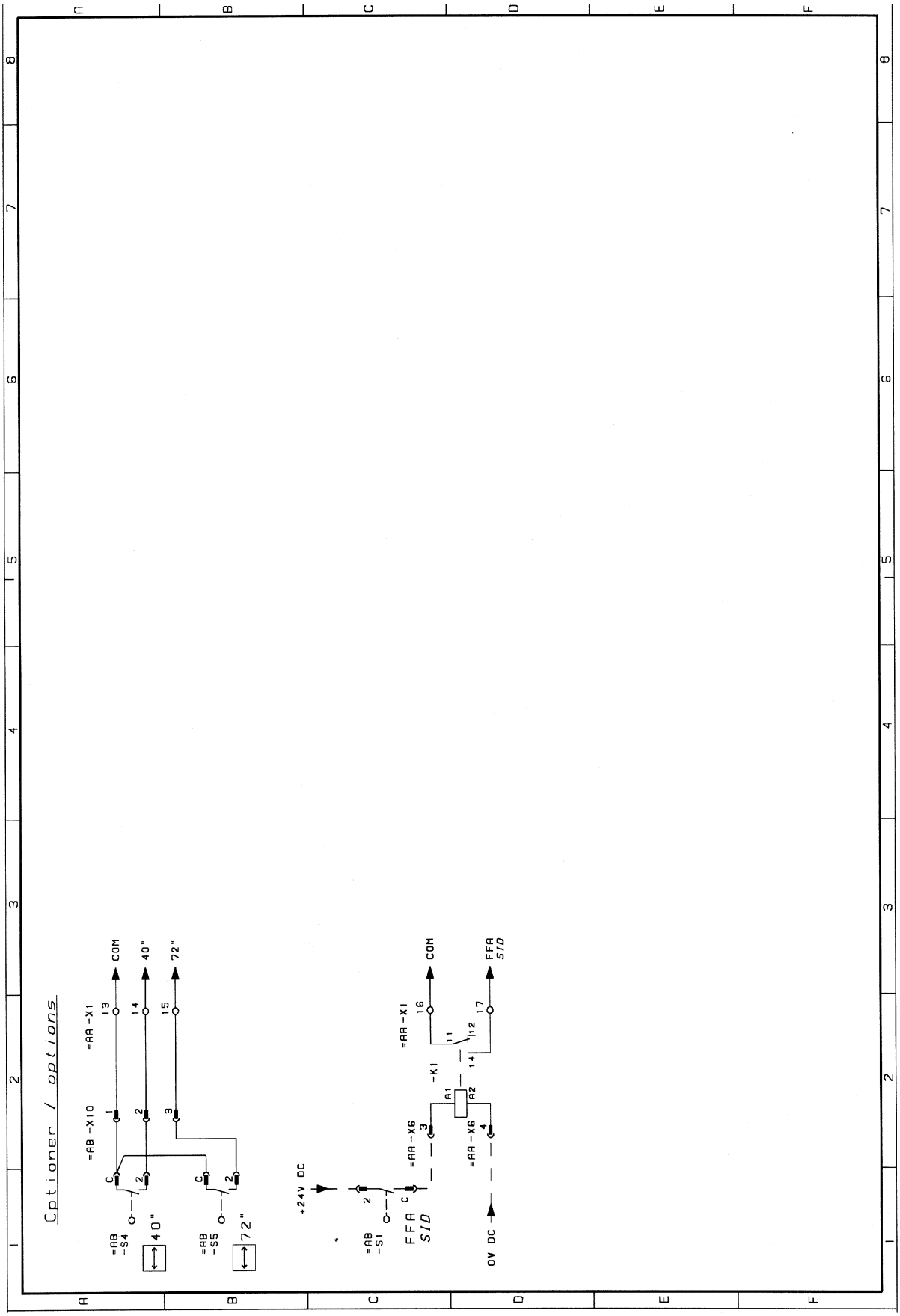
1.13 Schematics sheet 4



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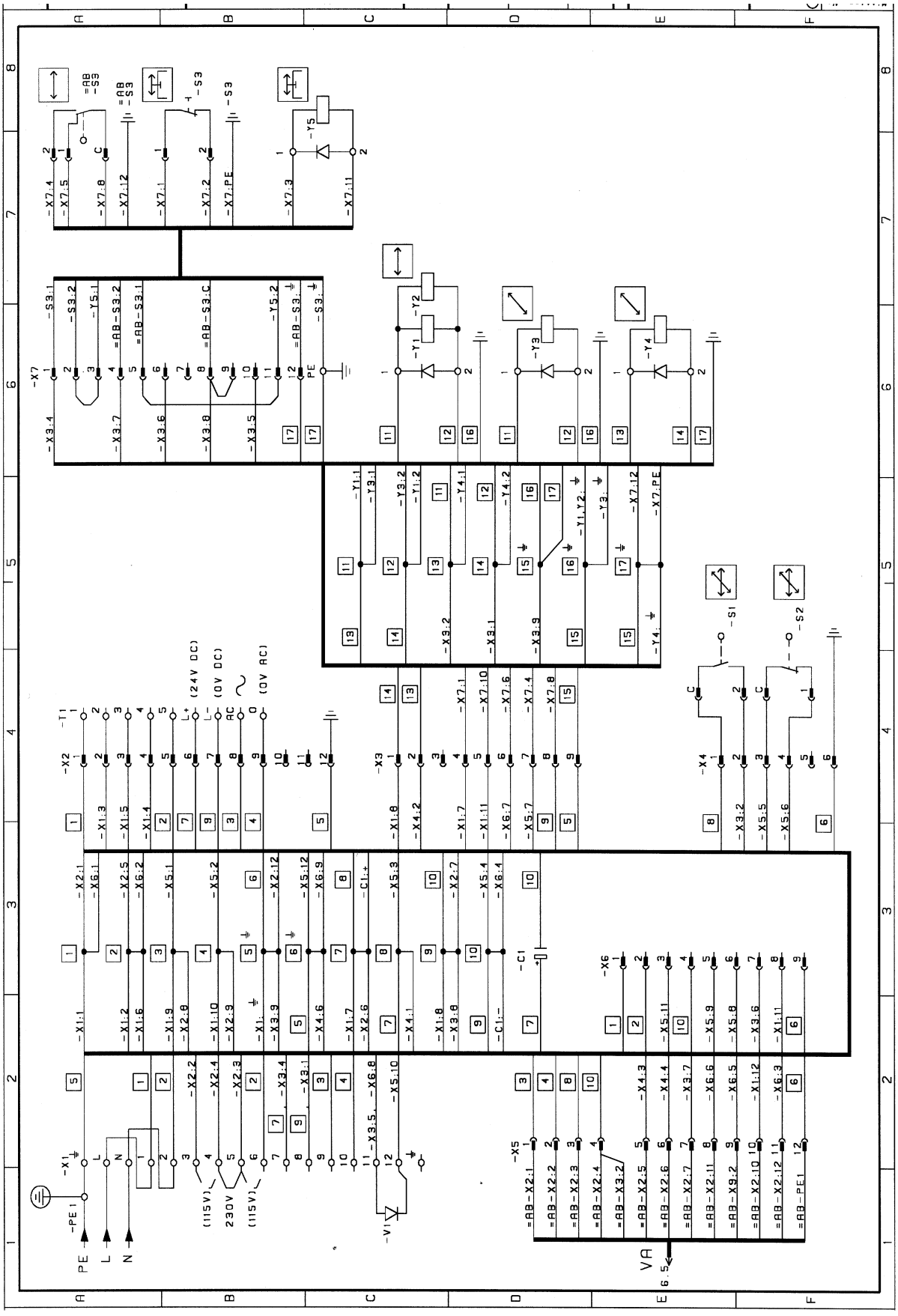
1.13 Wiring Diagram sheet 5



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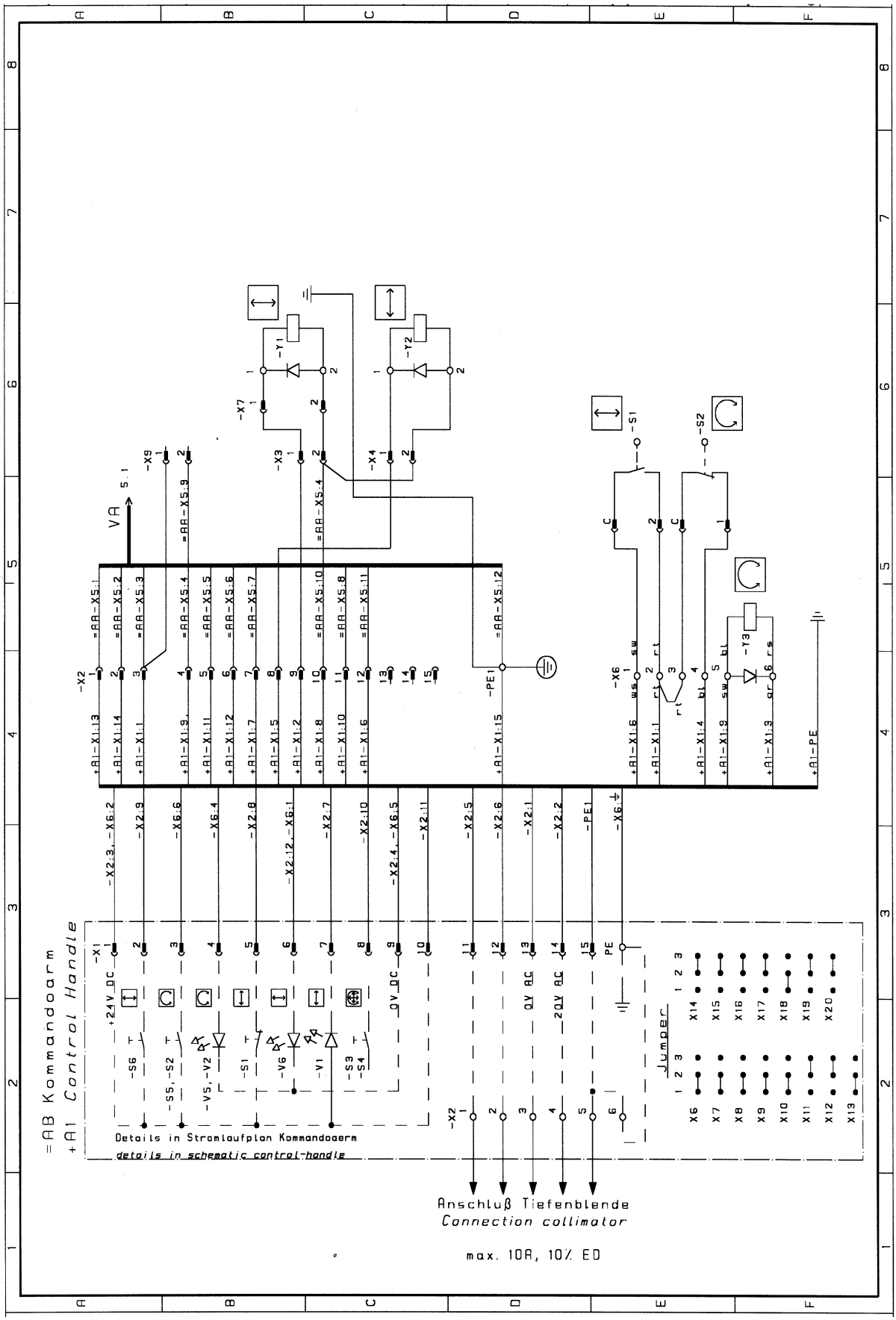
1.13 Wiring Diagram sheet 6



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1.14 Description of components for circuit diagram sheet 1

=AA- Table

=AA-C1 By-pass condenser 24V DC

=AA-F1 Circuit fuse
=AA-F2 Fuse 24V DC
=AA-F3 Fuse 20VAC

=AA-PE1 Main earthing bolt

=AA-S1 Foot control brake release table top
=AA-S2 Foot control for collimator light
=AA-S3 Switch release Bucky brake

=AA-T1 Mains transformer

=AA-V1 Uncoupling diode
=AA-X1 Terminal strip
=AA-X2 Plug in connection power pack
=AA-X3 Plug in connection brake solenoid table top
=AA-X4 Plug in connection foot control
=AA-X5 Plug in connection Column
=AA-X6 Plug in connection Tomo
=AA-X7 Plug in connection Bucky brake

=AA-Y1 Brake solenoid table top longitudinal
=AA-Y2 Brake solenoid table top longitudinal
=AA-Y3 Brake solenoid table top transverse left
=AA-Y4 Brake solenoid table top transverse right
=AA-Y5 Brake solenoid for Bucky brake

=AB- Stand

=AB+A1 Control Arm

=AB+A1-X1 Plug-in connection control arm
=AB+A1-X2 Terminal strip for collimator
=AB+A1-X3 Terminal strip for option

=AB+A1-S1 Switch for horizontal brake release
=AB+A1-S2 Switch for rotational break release
=AB+A1-S3 Switch release all brakes
=AB+A1-S4 Switch release all brakes
=AB+A1-S5 Switch for rotational break release
=AB+A1-S6 Switch for vertical brake release

=AB+A1-V1 LED Stand - Bucky centring
=AB+A1-X2 LED - rotation angle 0°, +/-90°
=AB+A1-X3 LED - option
=AB+A1-X4 LED - option
=AB+A1-X5 LED - rotation angle 0°, +/-90°
=AB+A1-X6 LED - vertical FFD

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1.14 Description of components for circuit diagram sheet 2

=AB-K1	Relay for optional FFD
=AB-PE	Main earthing bolt Stand
=AB-S1	FFD switch vertical
=AB-S2	Switch tube rotation 0°, +/-90°
=AB-S3	Switch Bucky engaged
=AB-S4	FFD switch horizontal 40“
=AB-S5	FFD switch horizontal 72“
=AB-X2	Plug-in connection for tube support arm
=AB-X3	Plug-in connection for vertical brake
=AB-X4	Plug-in connection for horizontal brake
=AB-X5	Plug-in connection for collimator
=AB-X6	Terminal strip in the tube support arm
=AB-X7	Plug-in connection in vertical brake
=AB-X9	Plug-in connection for =AC-S3
=AB-X10	Plug-in connection for =AB-S4, -S5
=AB-Y1	Vertical brake
=AB-Y2	Horizontal brake
=AB	

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2. Mounting

2.1 Unpack equipment parts

Remove table from the palette
In addition:
Remove both artificial caps (Fig. 1 Pos. 1) and loosen beneath the socket head cap screw. Tilt front plate „above“ (Pos. 2) carefully to the outside and then take out from underneath. Take out accessory box from the table.

Fig. 1

Fig. 2

Dismount the below placed table cover (Fig. 2/Pos. 3) with both screws (Pos.4). Loosen both transport screws (Fig.2/Pos. 5) from the palette and push to the bottom. Push the table to the back from the palette (Fig. 3). Tilt table to the back, pull out palette to the front and take off the table carefully.

Fig. 3

Fig. 4

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Dismount both closing caps (Fig. 4/Pos. 7 and 8) and loosen the transport security screws of the rail stand, then push to the bottom. Remove rail stand from the palette and take to the assembly area. Dismount transport security plates of the column. (Leave column on the palette until assembly). Unpack equipment parts and check for completeness according to shipping list respectively order. Check complete delivery upon damage before assembly start.

2.2 Assembly of the table and rail stand

Take the table to assembly area. Place the rail stand behind the table. Align the rail stand (Fig. 5/Pos.9) to the right or left side of the table (Pos. 10) depending on the way of assembly (according to drawing for installation of a Bucky wall stand left or right).

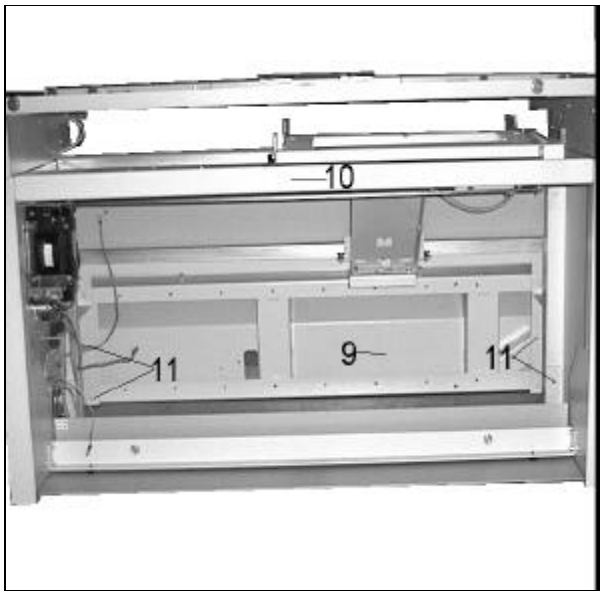

Fig. 5

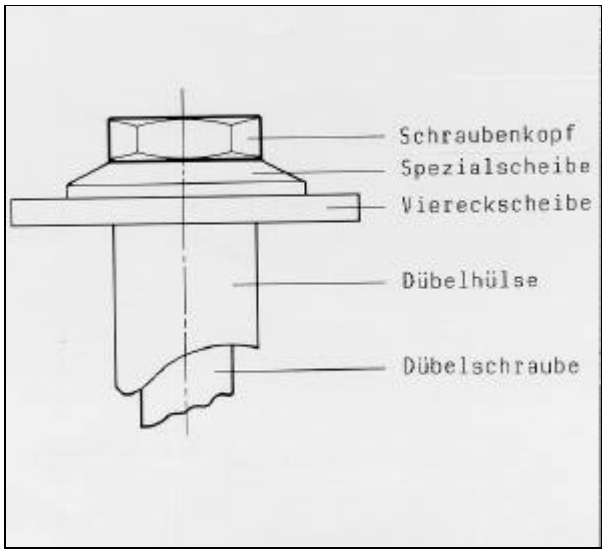

Fig. 6

Fasten the rail stand with 4 screws (Pos. 11) to the table. Push table with rail stand over the fastening bore-holes at the assembly place. Respectively align the table at the assembly place, mark the 5 fastening bore-holes and bore. Insert the included set pin (Fig. 6) and insert screws and washers.

Fig. 7

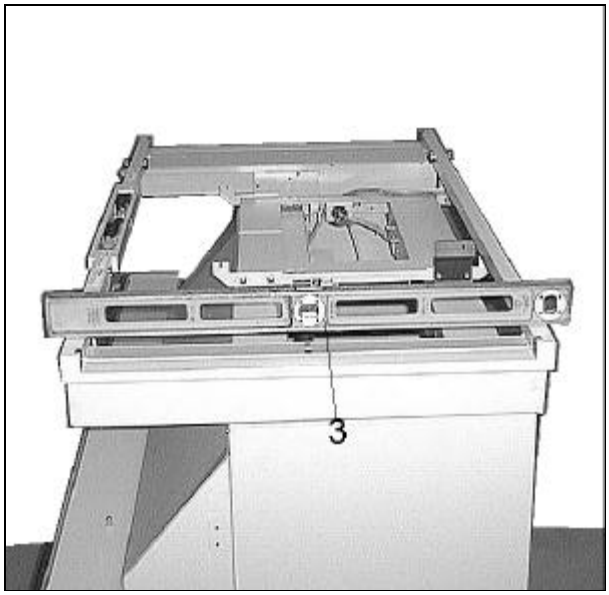

Fig. 8

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Align table with rail stand according to air level (Fig. 7 Pos. 1,2 and Fig. 8/Pos. 3). If necessary, align with washers (Fig. 9/Pos. 4 and 5). Fasten all screws tightly.

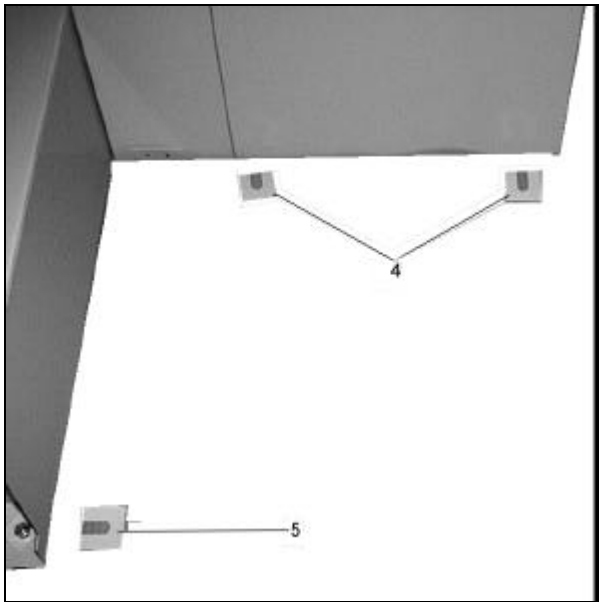

Fig. 9

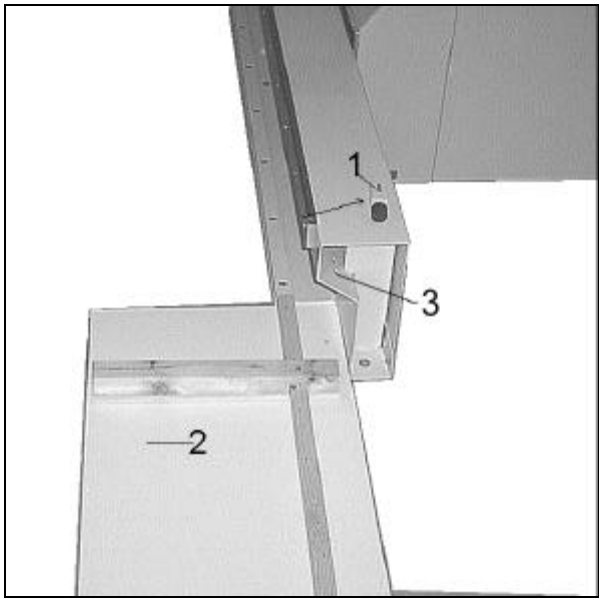

Fig. 10

2.3 Assembly of the column

The column will be shipped with inserted counterweights. The counterweight in the column is secured for the transport with two screws.

Attention:
Remove transport security not before assembly of the tube and collimator.

To insert the column into the rail stand easily, an assembly plate is included to the shipment. It is constructed so that it can slide on a normal floor easily.
Dismount limit stop (Fig. 10 Pos. 1) from the rail stand.
Set up (Fig. 11/Pos. 1) and place on the assembly plate (Pos. 2). Push the assembly plate to the rail stand and align (Fig. 11/Pos. 2). Insert the column from the assembly plate into the rail stand.

Remark:
When inserting pay attention the bearing and brake magnet.

Mount the limit stop (Fig. 10/Pos. 1) again to the rail stand.

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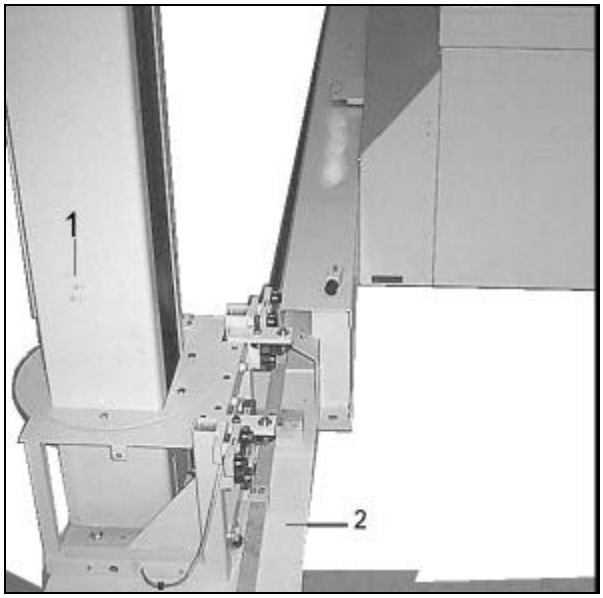

Fig. 11

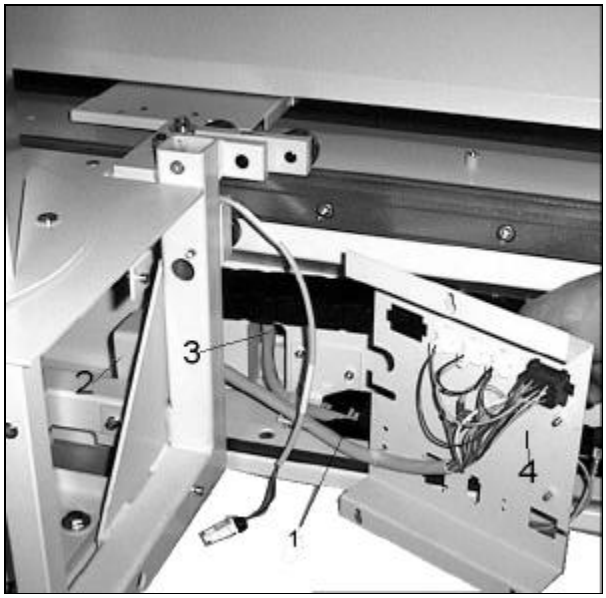

Fig. 12

Mount the cable guide chain (Fig. 12/Pos. 1) to the rail stand - back wall - and to the column carriage (Pos. 2). Insert the end of the cable (Pos. 3) into the table. Mount the distributing plate (Pos. 4) to the column carriage.
Dismount cover (Fig. 13/Pos. 1) from the catch (Pos. 2). Loosen both screws (Pos. 3) and mount the catch.
Attention: The catch has to be adjusted in height direction so that the switch nose (Pos. 4) is centred to the switch spring of the column Bucky coupling.

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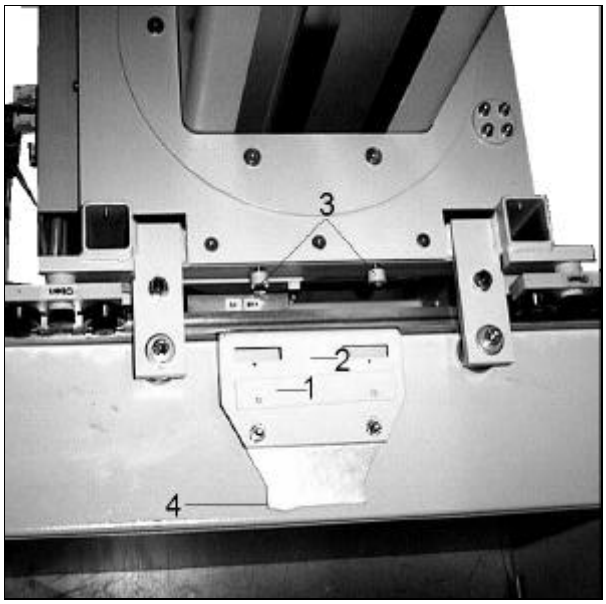

Fig. 13

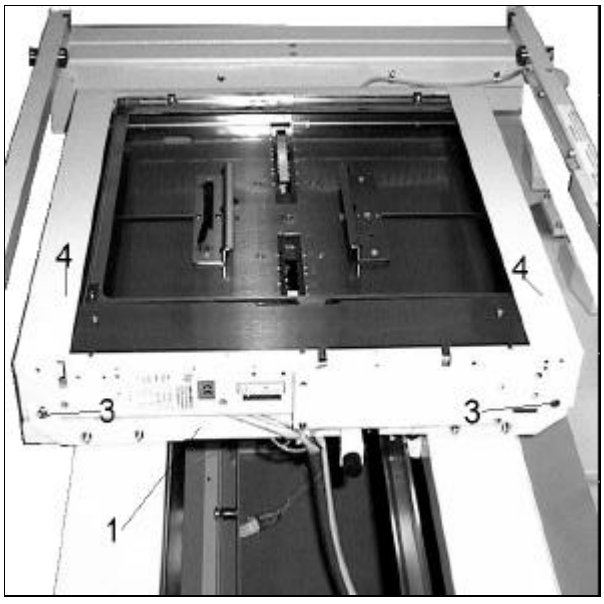

Fig. 14

2.4 Assembly of Bucky

Remark:
Buckys of different manufacturers can be installed. The equipment will be prepared according to the order and the necessary fastening materials will be included to the shipment.

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Insert the Bucky (opening of cassette to the front) in the Bucky carriage (Fig.14/Pos.1).
Install connection cable and detector cable according to the instructions of the manufacturer.

Bucky P

Fastening with 2 screws each (Fig. 14/Pos. 3) left and right lateral. Put at the top the cover angle with the longer side (Fig. 14/Pos. 4) to user- and back side and fasten above with 3 screws each and U-washer.

Philips

Fastening with 2 screws (Fig. 14/Pos. 3) left and right lateral. Put at the top the cover angle with the longer side (Fig. 14/Pos. 4) to user- and back side and fasten above with 3 screws each.

Siemens

Fastening with 2 screws each (Fig. 14/Pos. 3) left and right lateral.

2.5 Assembly of the table plate

Remark:
If there are less than 2900 mm from the mid of table to a wall available, please mount the table plate according to section 2.5.1.

Remove table plate out of packing.
Dismount on one grinding the limit stop (Fig. 18/Pos. 1) and push the table top (Fig. 15/Pos. 2) on the transverse carriage.

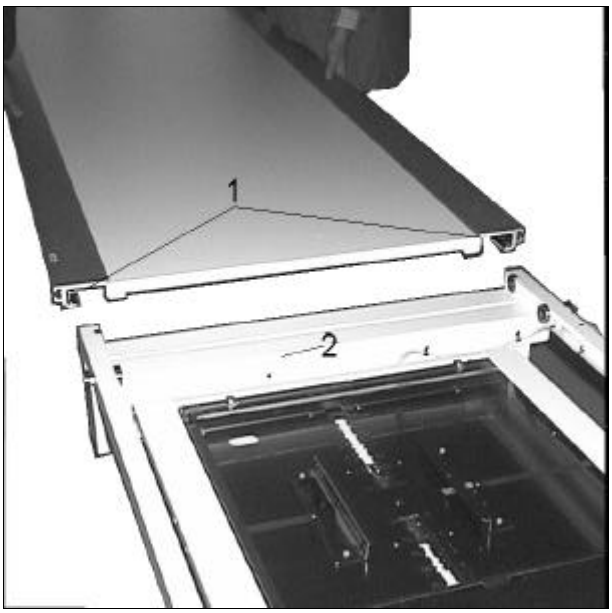

Fig. 15

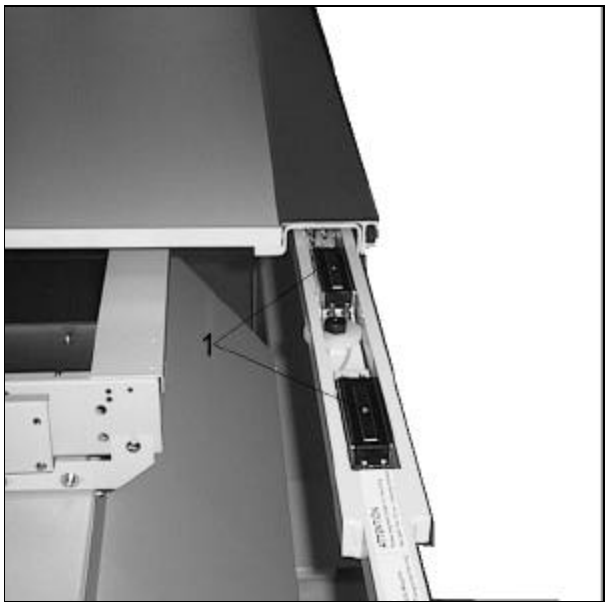

Fig. 16

Attention: Pay attention to the brake magnets while inserting the table top.

Remount limit stops (Fig. 18/Pos. 1)

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Put the included pasteboard of the table top packing on the table top during assembly to avoid any damages.

2.5.1 Assembly of the table top in small rooms

Dismount on both grindings the limit stops Fig. 18/Pos. 1). Dismount the bearings (Fig. 17/Pos. 1 and 2) which are in the front.

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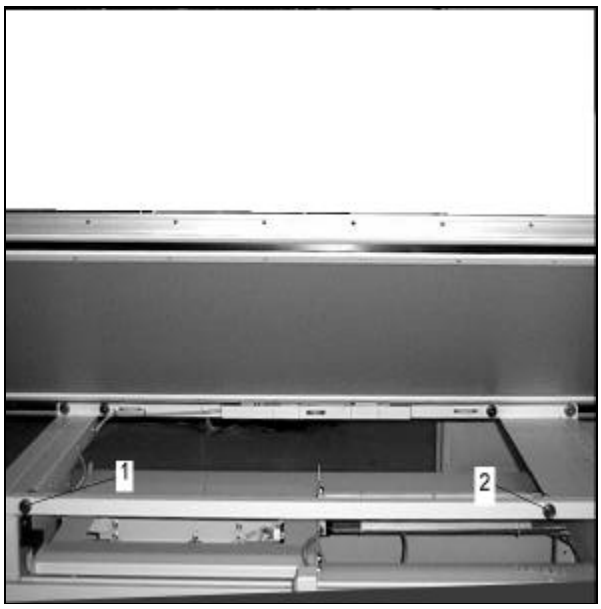

Fig. 17

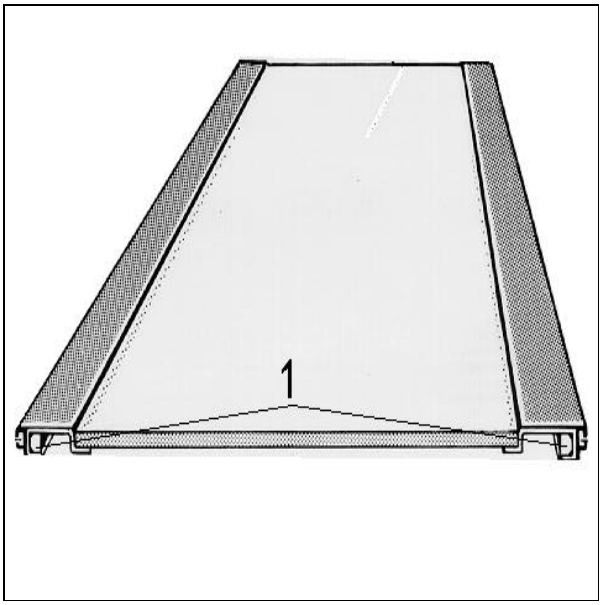

Fig. 18

Put the table top on the table frame and lift the table top on the user side about 45°. Put meanwhile the table top rail from behind over the Polyamid roll and bearings. Lower the table top carefully. Move the table top longitudinal and remount the dismounted bearings. Readjust the regulations of the eccentric. Remount the limit stops (Fig. 18/Pos. 1).
Put the included pasteboard of the table top packing on the table top during assembly to avoid any damages.

2.6 Assembly of the tube and collimator

Siemens

Dismount the intermediate ring (Fig. 19/Pos. 59). Mount the window flange (Pos. 58) between the adjusted flange at the factory (Fig. 19/Pos. 57) and mount to the tube housing.

Collimat

Dismount the intermediate ring (Fig. 20/Pos. 1) out of the collimator (Pos. 2). Mount the window flange (Fig. 20/Pos. 3) with the control arm to the tube housing. Put the collimator (Pos. 4) onto the intermediate ring (Pos. 5) and fasten with fixing plates.

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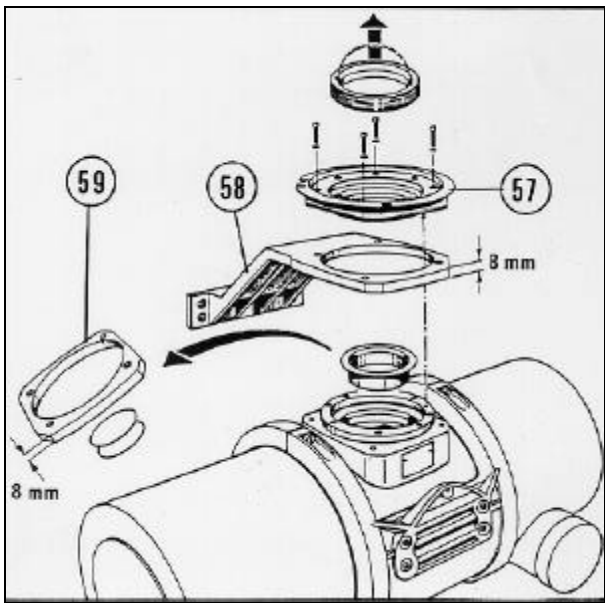

Fig. 19

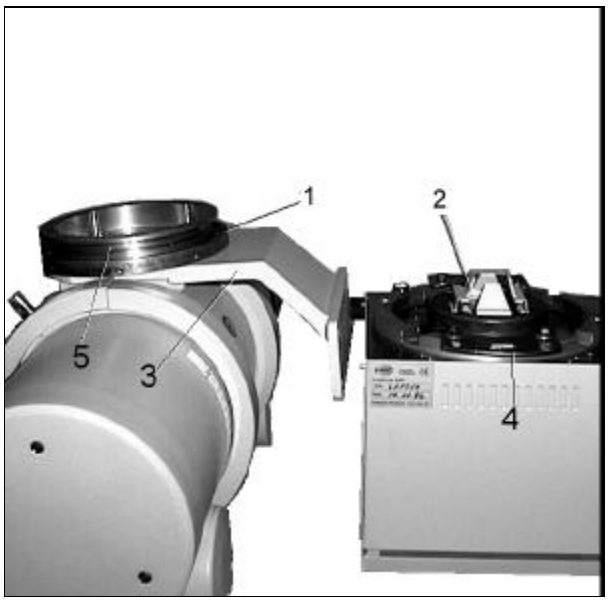

Fig. 20

Philips

Mount the control arm with the Z-angle (Fig. 21/Pos. 1) to the Rotalix.

Other manufacturer

Fasten the control arm (Fig. 22/Pos. 1) with the window flange (Pos. 3) onto the tube housing and mount the collimator.

USA version

Mount the control arm (Fig. 22/Pos. 1) with the support angle (Pos. 2) between tube housing and collimator.

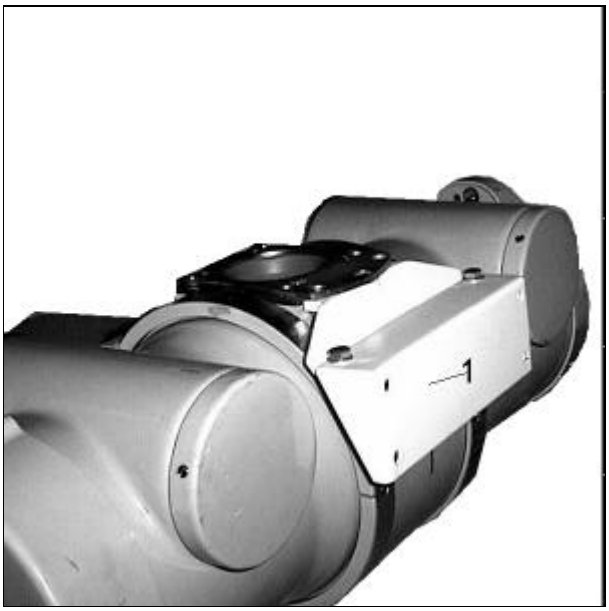

Fig. 21

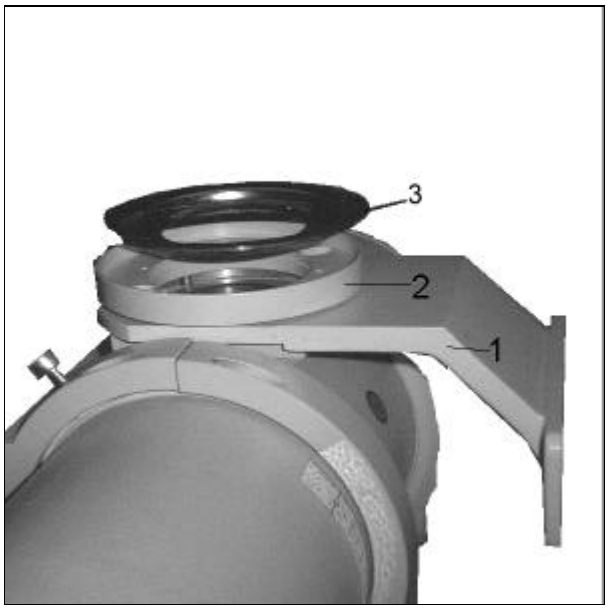

Fig. 22

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2.7 Assembly of the tube holding support

Remove the above screws (Fig. 23/Pos. 1) and loosen the lower screws (Pos. 2) approx. 10 mm. Remove the cover of the tube holding support (Fig. 25/Pos. 1).
Put the tube holding support to the carriage support and insert the cable for the SID switch (Fig. 24/Pos. 3) in the tube holding support. Put in over the lower screws and fasten with the upper screws (Fig. 24/Pos. 1) the tube holding support to the vertical carriage.

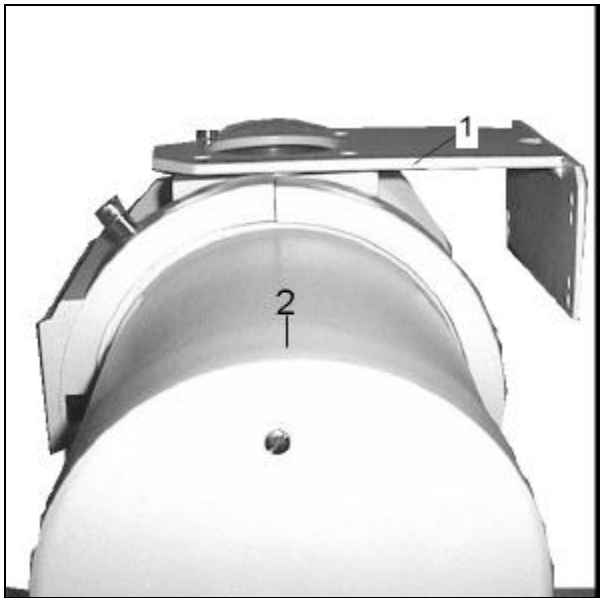

Fig. 23

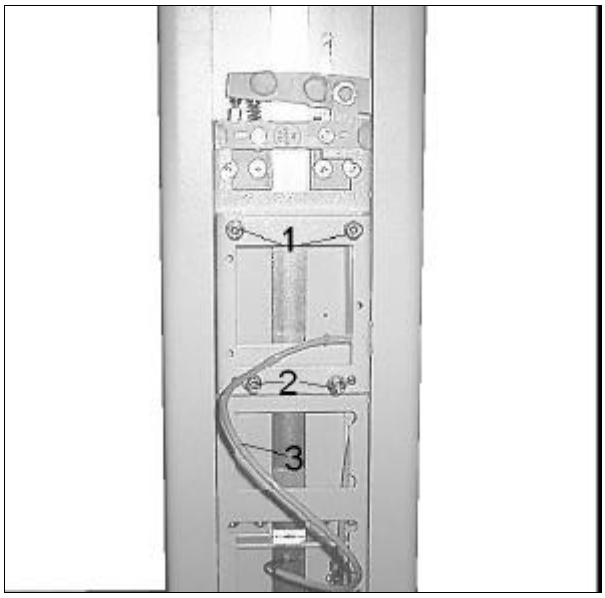

Fig. 24

Fasten the lower screws (Fig. 24/Pos. 4). Lift the tube holding support slightly, then push on safety brake (Fig. 26/Pos. 1) and lower the tube holding support slowly.
Tighten the rope and the tube holding support is suspended to the rope. Install cable for SID switch in support arm.

2.8 Assembly of the tube on tube holding support

Move the gravity centre of the tube/collimator/control board unit into the rotation axis by displacing the unit vertically (in direction of x-rays) on the compensating plate (Fig. 25/Pos. 1). Insert spacer plate (Pos. 2) if necessary.

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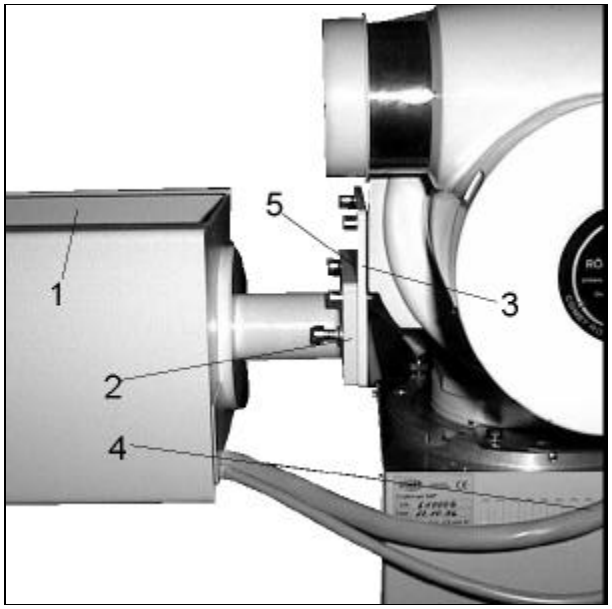

Fig. 25

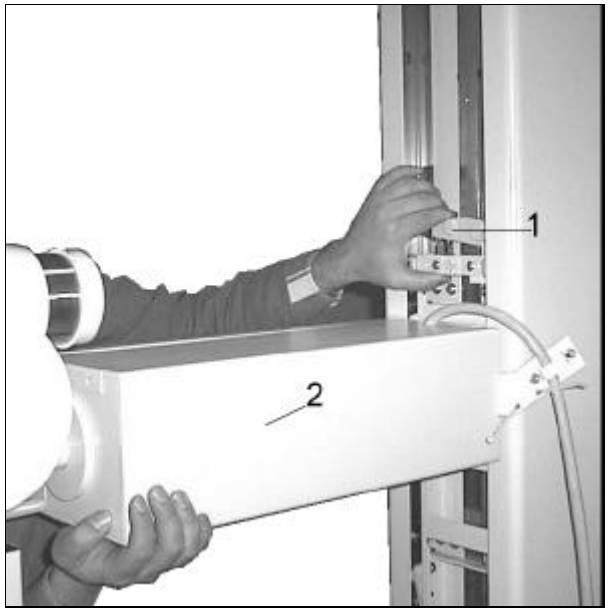

Fig. 26

Note: The compensating plate must in any case be installed as distance plate, even if the centre of gravity lies in the rotation axis.

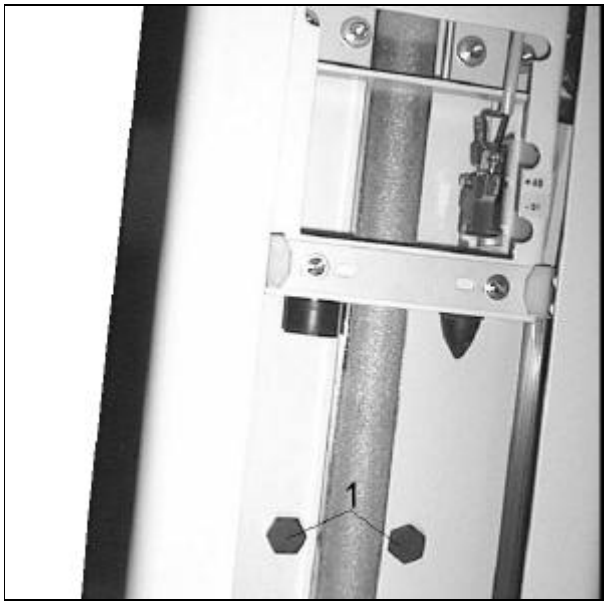

Fig. 27

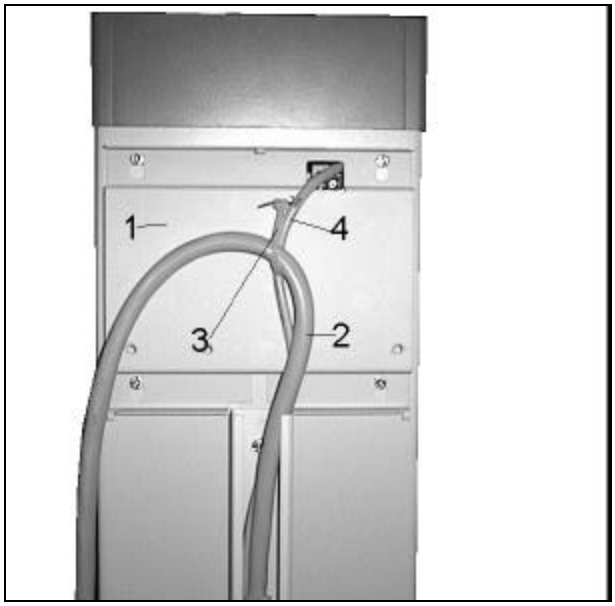

Fig. 28

Remove transport security screws (Fig. 27/Pos. 1) and insert in the head part the nuts (Fig. 31 /Pos. 1).

2.9 Assembly of the control arm

Dismount the cover (Fig. 30/Pos. 1) on the control arm (Pos. 2). Remove the 4 screws (Pos. 3) and mount the cover onto the control arm fastening. Cut in the cable (Fig. 25/Pos. 3) into the control arm and bring it to the cover. Then fasten with the 4 screws (Pos. 3).

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2.10 Assembly and installation of the cable

Mount the cable box (Fig. 28/Pos. 1) to the head of the column. Remove the cover of the cable tunnel.
Insert the cable in the cable tunnel (Pos. 2) on the backside of the column. Screw down the cable collar in the cable tunnel (Fig. 29/Pos. 1). Plug in the plugs in the distributor plate (Fig. 12/Pos. 4). Tighten the cable to the cable box (Fig. 28/Pos. 1) and fasten with cable binder (Pos. 2). Install cable for vertical brake and earth cord in head part. Put cover onto the cable tunnel. Install the high-voltage cable to the tube. Place cable over the cable collar of the vertical carriage to the cable box on the backside of the column.

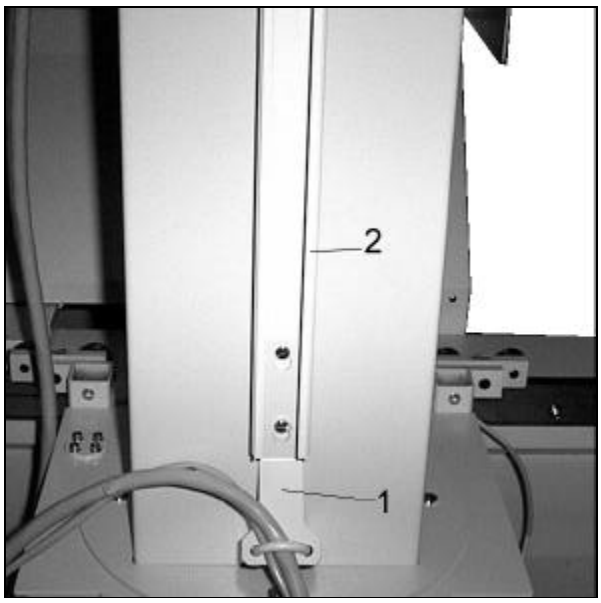

Fig. 29

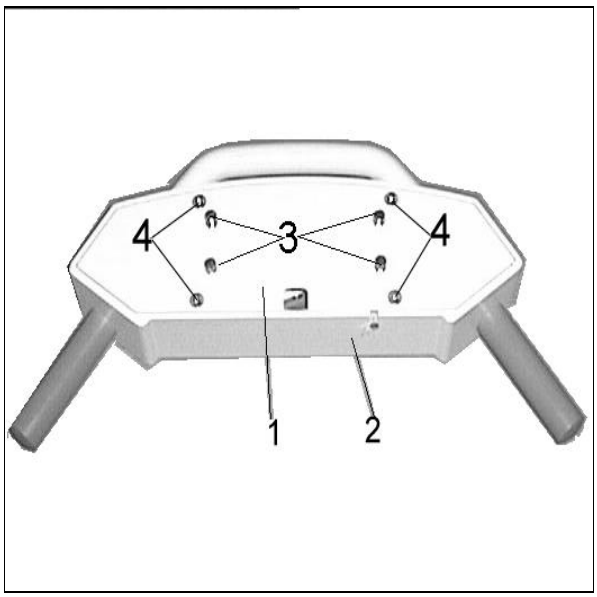

Fig. 30

Leave enough running noose to the wall terminal box or ceiling terminal box (option). Place the cables further to the x-ray generator and install according to the installation plan of the x-ray generator.

2.11 Counterweight on the column

The tube holding support has to be counterbalanced with the installed cables. Loosen brake and check the counterweight.
If there is a ascending force of the tube holding support remove weight plates out of the counterbalance box.
If there is a descending force of the tube holding support put in weight plates in the counterbalance box.

Note:
Determine the weight difference with the spring balance. Drive column beside table and pull the tube holding support to the bottom. Secure counterbalance box with the security screw Fig. 28/Pos. 1). Lift the tube holding support (Fig. 26/Pos. 2) some cms. The tube holding support is suspended in the falling brake and the robe is not fixed.

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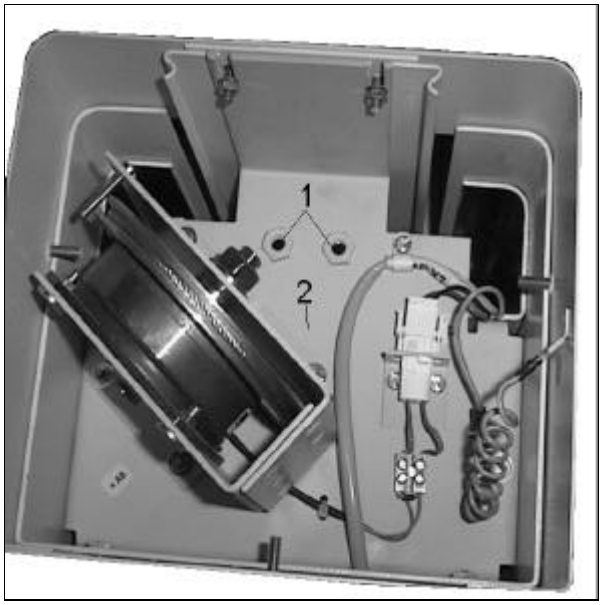

Fig. 31

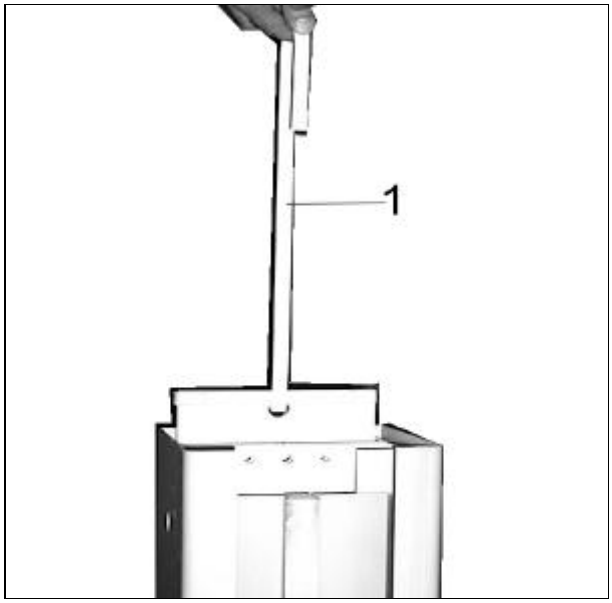

Fig. 32

Lift the head part (Fig. 31/Pos. 1) with the rope pulley and secure with a cord. Balance the calculated weight difference. Remount the head part.

Push the tube holding support slightly to the falling brake (Fig. 28/Pos. 1) and lower slowly the tube holding support.

2.12 Function control

Switch in x-ray generator and check all functions. If necessary perform corrections according to chapter 3. Adjustment.

2.13 Assembly of covers

Mount the lower table cover (Fig. 33/Pos. 1) with both screws (Pos. 2). Put in the front plate (Fig. 34/Pos. 1) with bracket in the gap (Fig. 33/Pos. 3). Fasten carefully with both socket head cap screw to table frame (Fig. 34/Pos. 2). Lock both bore-holes (Fig. 34/Pos. 3) with artificial cap.

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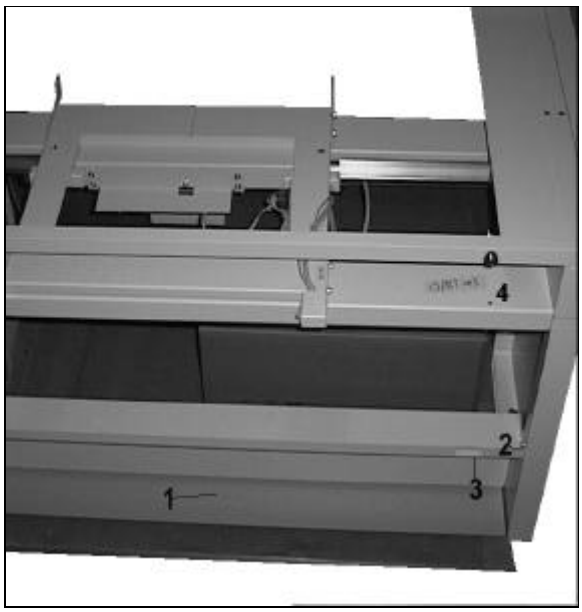

Fig. 33

Fig. 34

Drive vertical carriage to the head side and insert lower center cover (Fig. 35/Pos. 1). Drive vertical carriage carefully down.
Attention: The lower center cover has to be carried from the coulisse. Stick the upper center cover (Fig. 35/Pos. 2) to the lower center cover (Pos. 1). Drive the vertical carriage to the head side and fasten the center cover with the front border (Pos. 4).

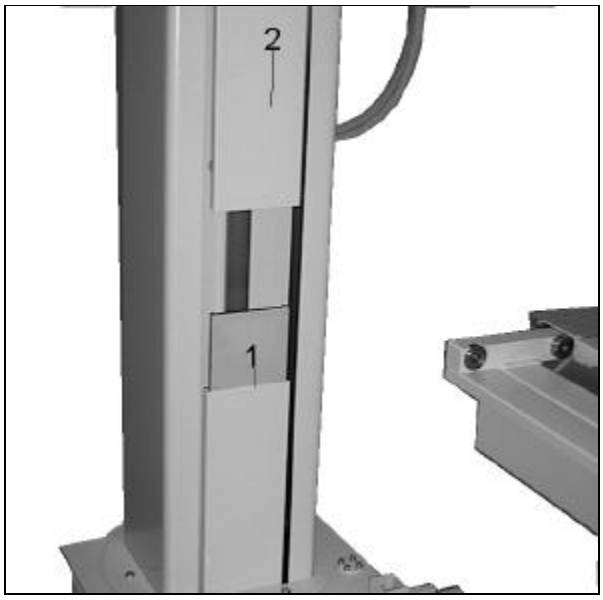

Fig. 35

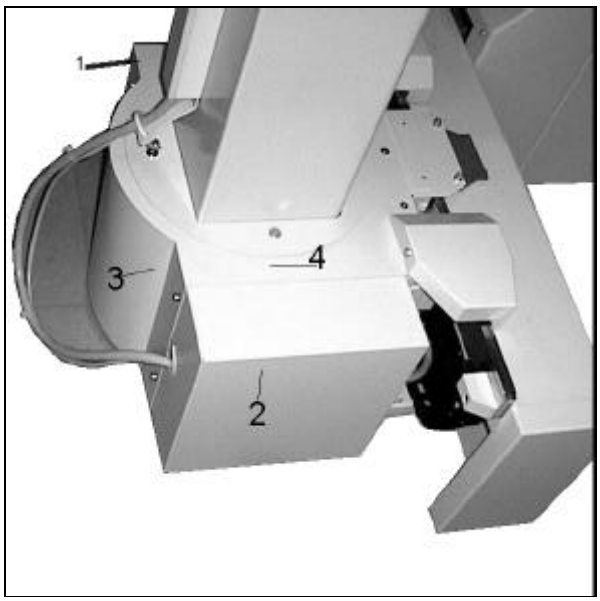

Fig. 36

Mount the left cover (Fig. 36/Pos. 1), the right cover (Pos. 2) and the cap (Pos. 3) to the column carriage (Pos. 4)

Clean equipment afterwards with a smooth cleansing agent.

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3 Adjustment

3.1 Adjustment of the column vertical

The column has been aligned constructional. If the alignment is not vertical after assembly please align the column.

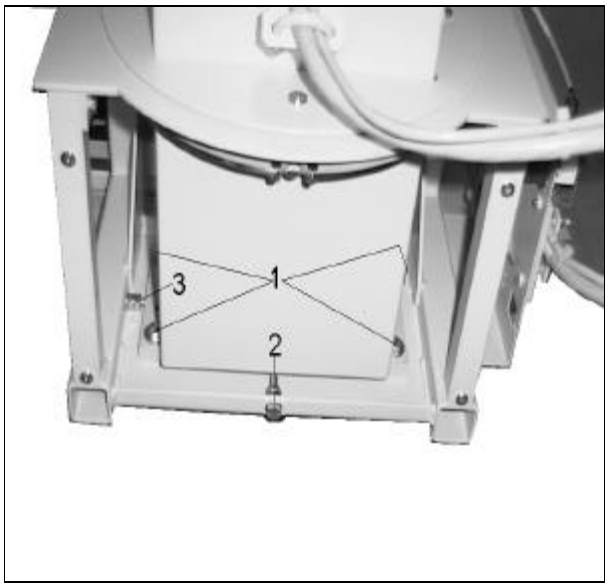

Fig. 37

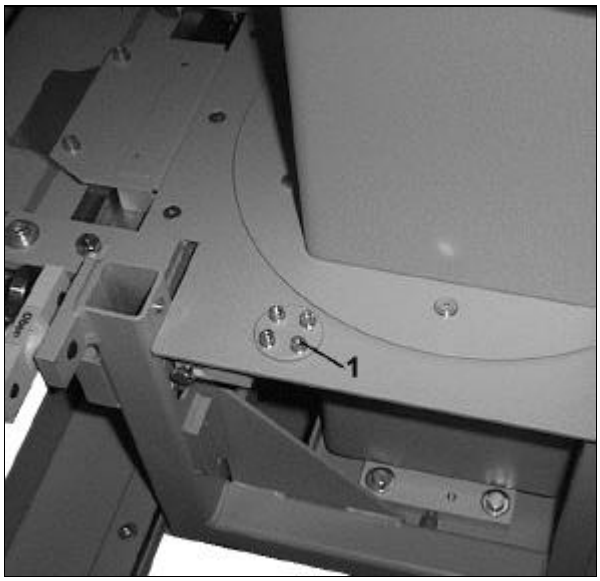

Fig. 38

Remark: Remove the covering plates (Fig. 36/Pos. 1-3) from the column carriage (Pos. 4). Loosen the 4 screws (Fig. 37/Pos. 1). Bring the column in the right position with the corresponding adjusting screw (Pos. 2 or Pos. 3). Fasten again the 4 screws (Pos. 1) and mount the covering plates again.

3.2 Adjustment of the column in direction of rotation

The tube holding support has been aligned constructional. If the alignment is not correct after assembly please align.
Remark:
Loosen the 4 screws (Fig. 38/Pos. 1) slightly. Adjust the column in the corresponding direction. Fasten the 4 screws afterwards tightly.

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Fig. 39

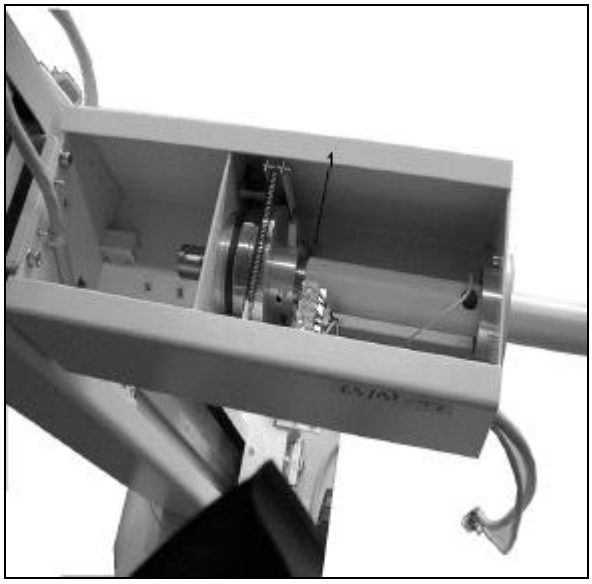

Fig. 40

3.3 Adjustment of the rotational axis respectively the supporting arm

The rotational axis has been aligned constructional. If the alignment is not correct after assembly please align.
Remark:
Loosen both lower fastening screws (Fig. 39/Pos. 1) with the shortened 6mm socket head cap key and both security screws (Fig. 39/Pos. 2). Perform adjustment with both adjustment screws (Fig. 39/Pos. 3) and the shortened 4 mm socket head cap key. Fasten afterwards the fastening screws and security screws.

3.4 Adjustment of the rotation detent (0° , 90 °)

The rotational axis has been aligned constructional. If the alignment is not correct after assembly please align.
Remark:
Loosen the nut (Fig. 40/Pos. 1) from catch. Adjust the X-ray tube assembly and fasten afterwards the nut.

3.5 Adjustment of the Bucky in table transverse direction

Loosen the screws (Fig. 41/ Pos. 1) from the four fastening strips. Adjust the Bucky transversely and fasten afterwards the four screws again.

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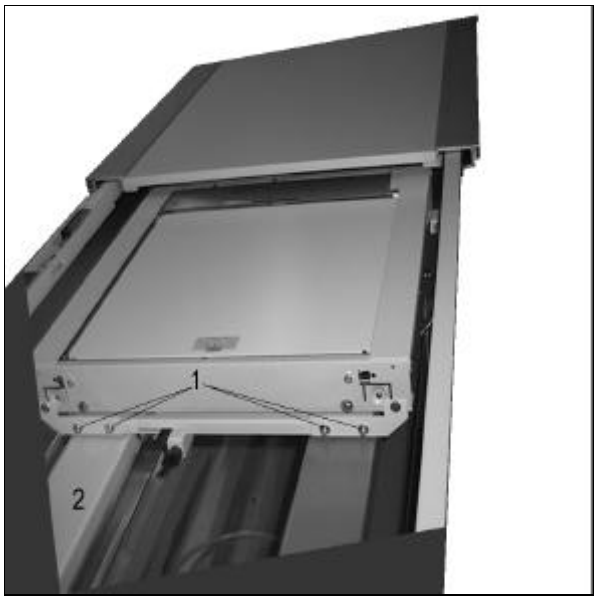

Fig. 41

Fig. 42

3.6 Adjustment of the vertical FFA switch

Loosen and displace the trip cam (Fig. 42/Pos. 1) with both screws (Pos. 2). If necessary transpose the rail by one hole division. Tighten all screw again.

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4 Technical Maintenance

4.1 Mechanical and electrical tests

The maintenance schedule described below is to be accomplished at 12-month intervals. If functional tests require power, switch off power immediately afterwards.
Defective parts must be replaced by genuine spare parts according to spare part lists. Use only non-acid grease for maintenance. Do not grease or oil ball bearings with sealing washers.

Preliminary work: Check column of damages or missing parts.
Check all cables upon damage especially on the fastening points.
If necessary replace or repair as far as possible after consultation with the customer.
Check cable loop of sufficient length.
Check all covers. If necessary replace damaged parts respectively arrange exchange.
Check range of equipment movements on blocked objects. When collision danger appears inform the user of all risks.

Tools: Usual assembly tools, standing ladder, torque balance key, air level, spring balance, feeler, cleansing agent, grease, wooden lath.....cm lg.,

Preparations: Switch off equipment
Dismount bumper and stop (Fig.45/Pos. 1+2) at either end of the table top from profile rail (lateral).

Fig. 45

Fig. 46

Take out table top and lay aside securely.
Dismount front cover (Fig. 46/Pos. 1+2).
Remove cover left and right (Fig. 47/Pos. 1).

Dismount front border and center cover (Fig. 48/Pos. 1).

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Dismount cover cap (Fig. 49/Pos. 1) on the left and right side of the rail stand.

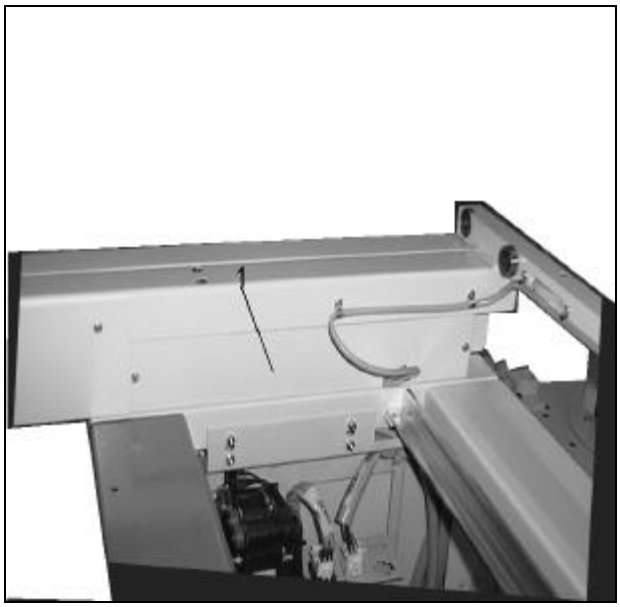

Fig. 47

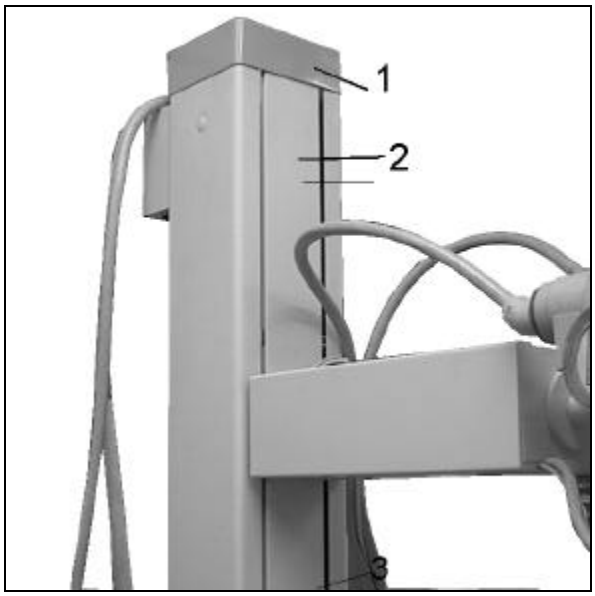

Fig. 48

Floor mounting: Check firmness of dowel bolts. Tighten if loose. Torque wrench 50 Nm (5.0 mkp).

Bucky carriage: Check on smooth running over total travel range. Running noise ?
Determine defective bearings. Replace if necessary.
Clean guide rail and bearings and grease lightly.
Check and if necessary adjust eccentric bearing (Fig. 50/Pos. 1).
Correct adjustment: The bearings can still be rotated by hand.
Check bumpers (Fig. 50/Pos. 2) on firmness and damage.
Switch-on equipment. Check brake (Fig. 50/Pos. 3) and adjust if necessary.

Fig. 49

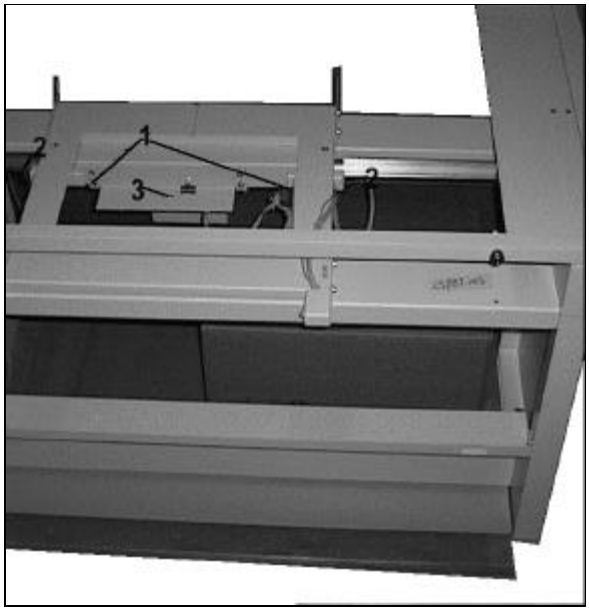

Fig. 50

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Table frame: Clean left and right guide shafts (Fig. 51/Pos. 1) and grease lightly. Switch-on equipment. Check performance brakes for transverse movement (Fig. 51/Pos. 2). Adjust if necessary.
Check bumpers on both sides (Fig. 51/Pos. 4) on firmness and damage.

Fig. 51

Fig. 52

Remount the caps on the left and right side (Fig. 47/Pos. 1).

Table top: Check plastic rollers (Fig. 51/Pos. 5) for trace of wear. Replace and grease if necessary.
Clean and check all ball bearings for table top movements on smooth running and damage. Replace and grease if necessary.

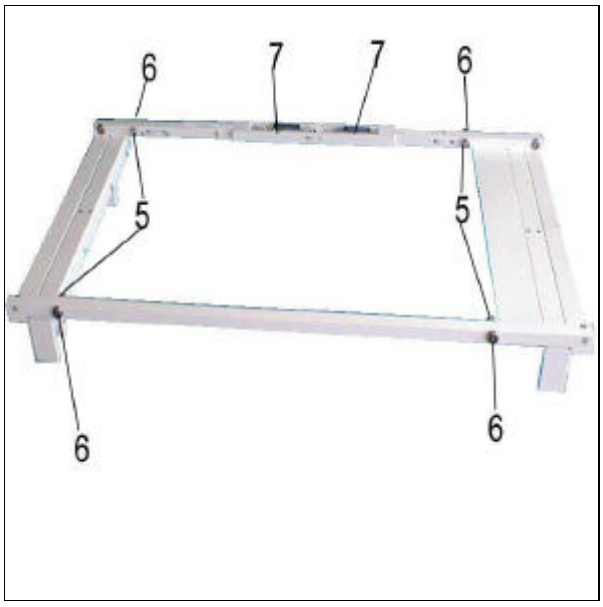

Fig. 53

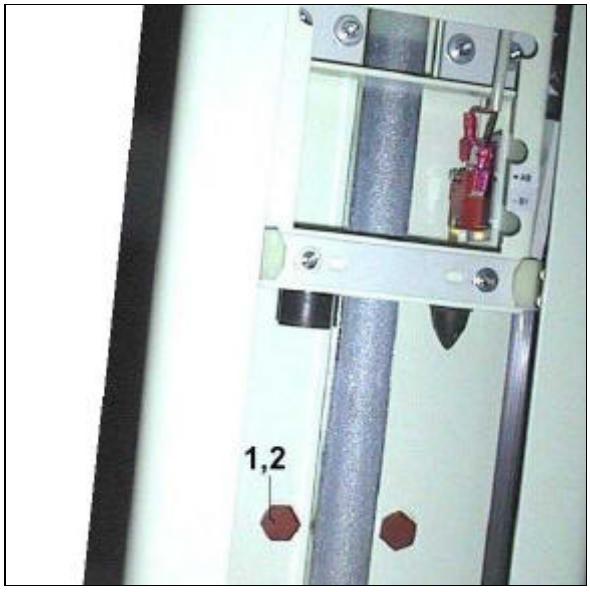

Fig. 54

Clean guide profiles of the table top.
Insert table top. Move over total travel range.
Running noise ? Smooth running ? Adjust bearings with eccentric (Fig. 51/Pos. 6) if necessary.

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Switch on equipment. Check performance of brake (Fig. 51/Pos. 7). Replace brake magnet if necessary .
Remount bumper and stop (Fig. 45/Pos. 1+2) at either end of the table top to profile rail sides.

Foot Treadle: Check on smooth operation and contact point. Adjust switch (Fig. 52/Pos. 1) if necessary.
Check connections of the switches.
Grease lightly both spring axis and bearing axis.

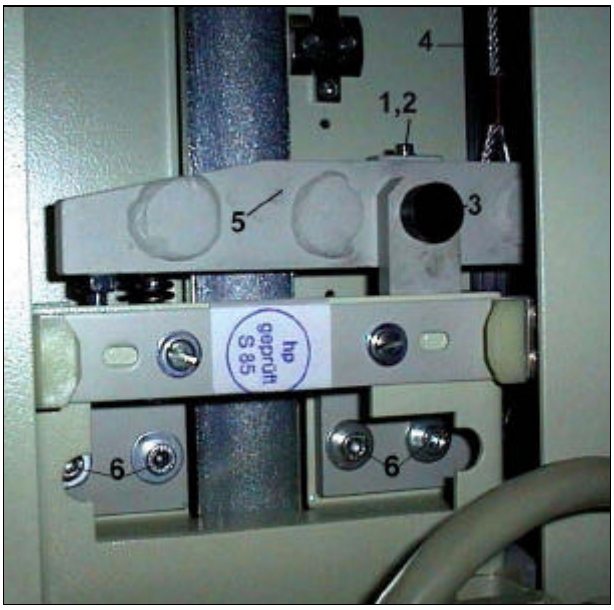

Fig. 55

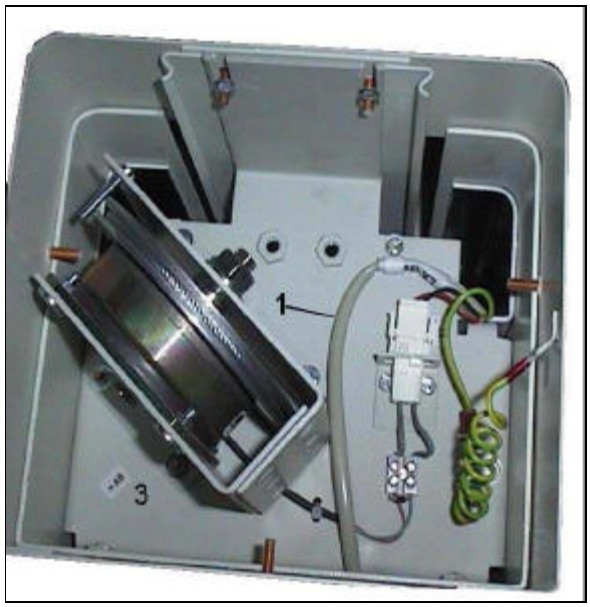

Fig. 56

Vertical carriage: Clean guide rail of the column and runners of the vertical carriage. Check on damage and grease lightly. Check on smooth running over entire travel range. Running noise ? Determine defective bearing. Replace if necessary.
Check performance of safety brake.
Note: Drive vertical carriage fully down until the threaded bore-hole (Fig. 53/Pos. 1) of the counterbalance is coincide with bore-hole in the column. Tighten counterbalance with screws M8 (Fig. 53/Pos. 2) and c corresponding washers. Lift vertical carriage some cms and release only if vertical carriage is suspended to the safety brake. Lift vertical carriage again, pull through safety brake, loosen on rope (Fig. 53/Pos. 4) to the head side. Release slowly vertical carriage. Dismount screws (Fig. 55/Pos. 2).
Clean steel rope (do not use fat solvents) and check upon damage. Check on smooth running over entire travel range. At the slightest sign of damage - (if there are 12 or more broken single lodes of the rope up to 100 mm or 3 and more single lodes up to 10 mm or a single lode broken) - inform the user directly. Further use of the equipment could endanger the security of patient and user. Do not use the equipment until the defective rope has been replaced.

Attention: The exchange of the rope has to be done at least every 3 years

Note: Drive vertical carriage fully down until the threaded bore-hole (Fig. 53/Pos. 1) of the counterbalance is coincide with bore-hole in the column. Tighten counterbalance with screws M8 (Fig. 53/Pos. 2) and corresponding washers. Lift vertical carriage approx. 30 cms and

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release only if vertical carriage is suspended to the safety brake. Lift head part (Fig. 54/Pos. 1) to the top and tighten with a cord to the column. Dismount steel rope of the counterbalance (Fig. 55/Pos. 1) after careful removal of the security washers (Fig. 55/Pos. 3) and bolts (Pos. 4). Support vertical carriage with the wooden lath. Remove screws (Fig. 56/Pos. 1) and security plate (Pos. 2). Release the lever of the safety brake (Fig. 4) in direction of the compression spring and pull out to the front the bolt (Pos. 3). Release rope from the safety brake. Remove from the head part the safety ring with safety nippers and dismount rope after removal of both security screws (Fig. 56/Pos. 1). Insert new rope in the head part and fasten to safety brake and counterbalance. Insert again the head part, pay attention to correct fitting. Remount lever of the safety brake to vertical carriage. Lift again the vertical carriage slightly while pulling through safety brake of the rope to the frontal side respectively releasing while pushing the safety brake against the compression spring. Then let off vertical carriage slowly. Dismount screws (Fig. 53/Pos. 2).
Check bearing play of the runners.
Note: Put a paper strip (thickness of 0,1 mm) between guide surface and opposite bearing. If necessary press the opposite bearing with a screw turner after removal of the screw (Fig. 57/Pos. 1) and tighten the screw again.
Remark: The opposite bearings must be rotatable by hand over the entire travel range.

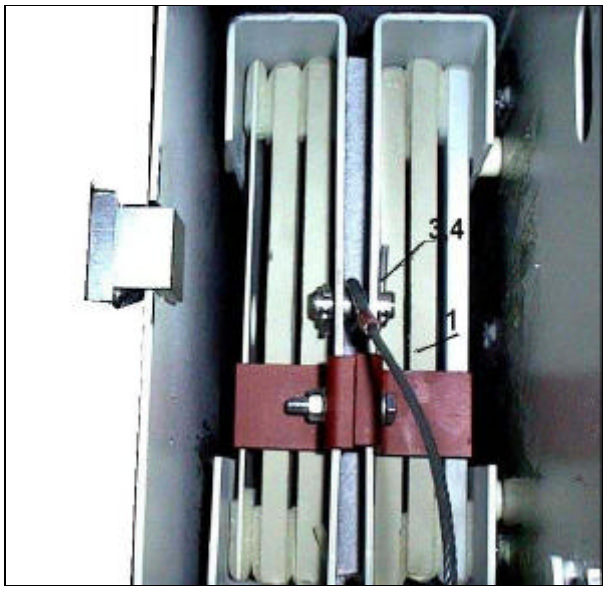

Fig. 57

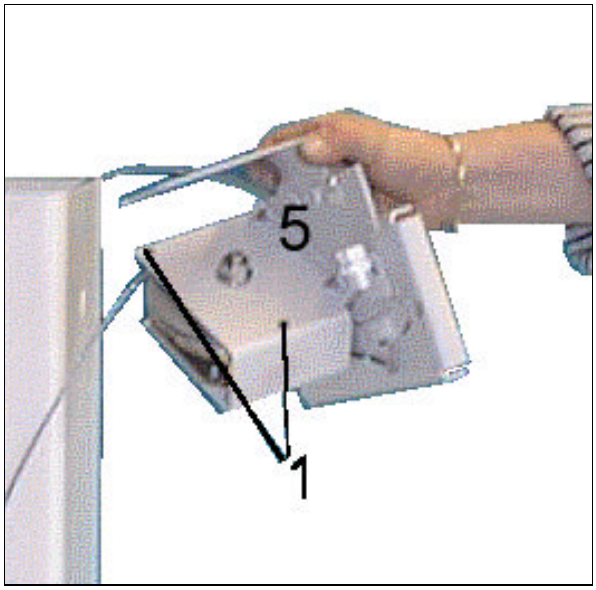

Fig. 58

Vertical brake: Remove abrasion of the magnet brake (Fig. 56/Pos. 3). Check air gap of the magnetic clutch with feeler (Fig./Pos.). Nominal value: 0,4 - 0,5 mm. Check brake power over the entire travel range. Should be min. 150 N. The air gap can be adjusted when adding or removing washers.

Note: Drive vertical carriage fully down until the threaded bore-hole (Fig. 53/Pos. 1) of the counterbalance is coincide with bore-hole in the column. Tighten counterbalance with screws M8 (Fig. 53/Pos. 2) and corresponding washers. Lift vertical carriage approx. 30 cms and release only if vertical carriage is suspended to the safety brake. Lift head part (Fig. 54/Pos. 1) to the top and tighten with a cord to the column. Dismount steel rope of the counterbalance (Fig. 55/Pos. 1)

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after carefully removal of the security washers (Fig. 55/Pos. 3) and bolts (Pos. 4). Dismount steel rope after removal of both security screws (Fig. 56/Pos. 1). Dismount guide block (Pos. 5) and adjust difference with washers. Remount guide block. Insert head part, pay attention to correct fitting. Lift again the vertical carriage slightly while pulling through safety brake of the rope to the frontal side respectively releasing while pushing the safety brake against the compression spring. Then let off vertical carriage slowly. Dismount screws (Fig. 53/Pos. 2).

Column carriage: Clean runners of column carriage. Check upon damage and grease slightly.
Check smooth running over entire travel range. Running noise ?
Determine defective bearing. Replace if necessary.
Check bearing play of the runners.
Note: Put a paper strip (thickness of 0,1 mm) between guide surface and opposite bearing. If necessary press the opposite bearing with a screw turner after removal of the screw (Fig. 58/Pos. 1) and tighten the screw again (Fig. 58/Pos.2).
Remark: The opposite bearings must be rotatable by hand over the entire travel range.
Switch on equipment. Check function of brake (Fig. 58/Pos. 4). Adjust if necessary.
Note: Loosen screws (Fig. 58/Pos. 5) and displace magnet angle until the play between brake rail and magnet is 0,2 mm. Tighten screws again.

Rail stand: Clean upper and lower guide rail. Check on damage and grease slightly. Check end stops on damage and check fitting. Check column stand with air level over the entire travel range. Adjust variations while adding spacers under or between.

Cleaning: Dirt accumulation which are not accessible for the cleaning stuff must be removed during maintenance work.
Steep contrast agent with water and remove.
After completion of the maintenance work clean all dirt accumulations.

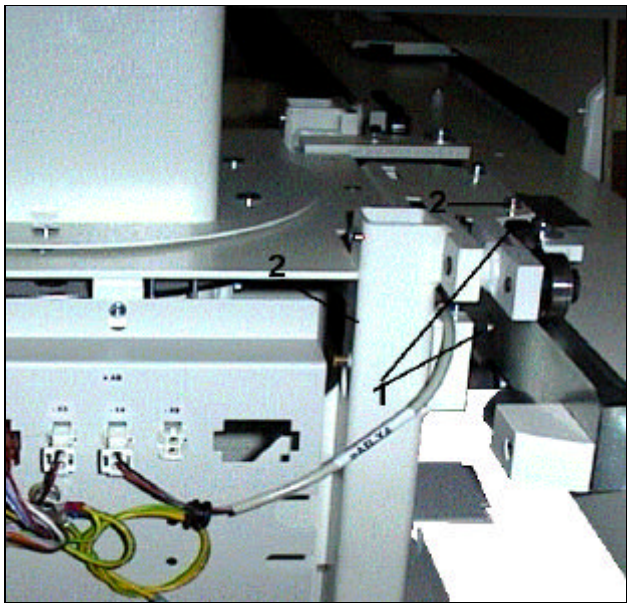

Fig. 59

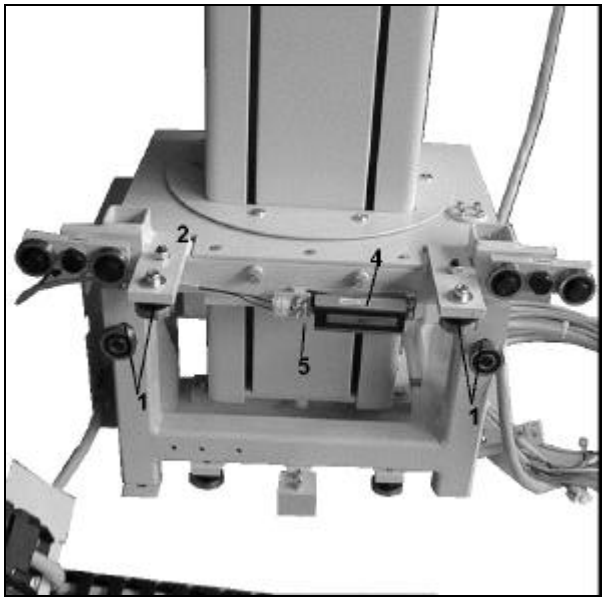

Fig. 60

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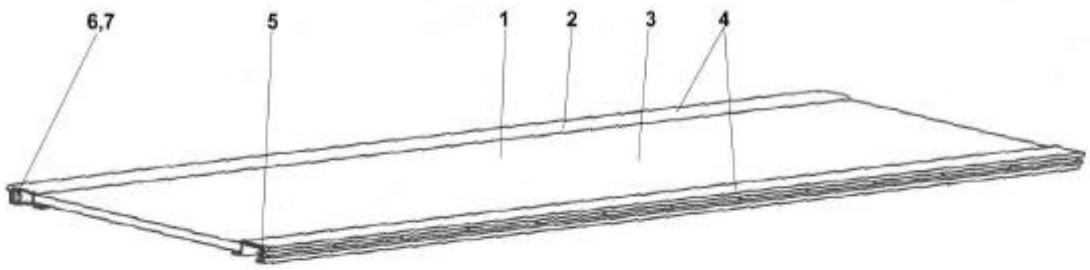
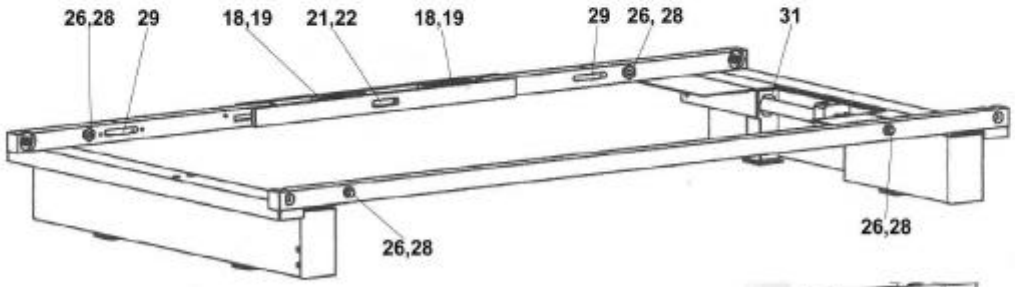
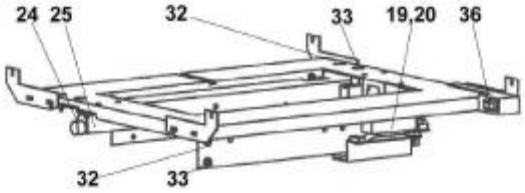
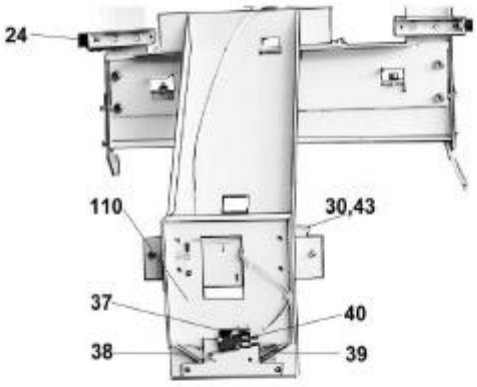
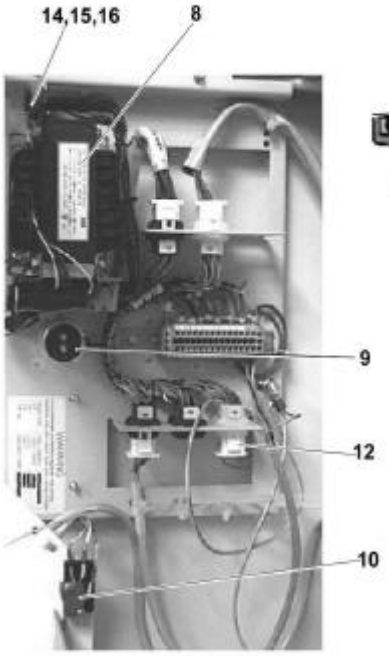
4.2 Spare Parts Table

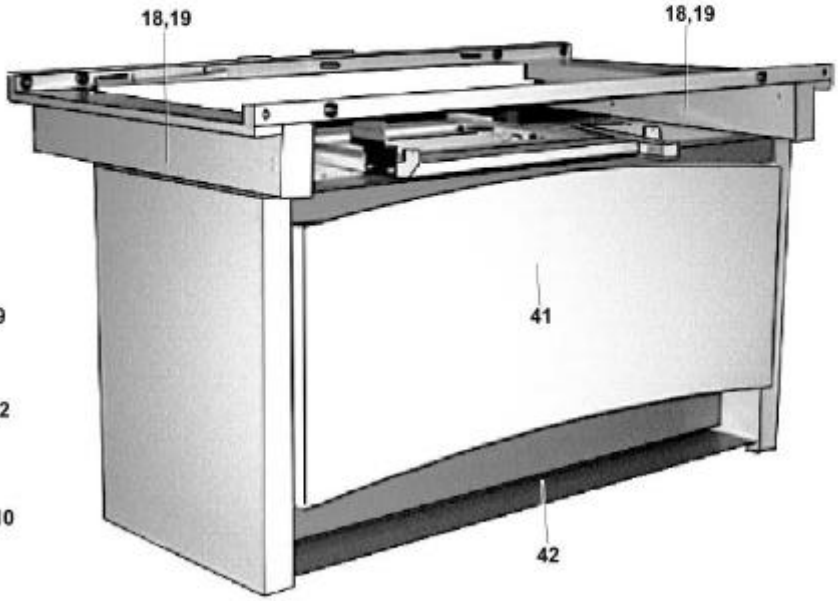












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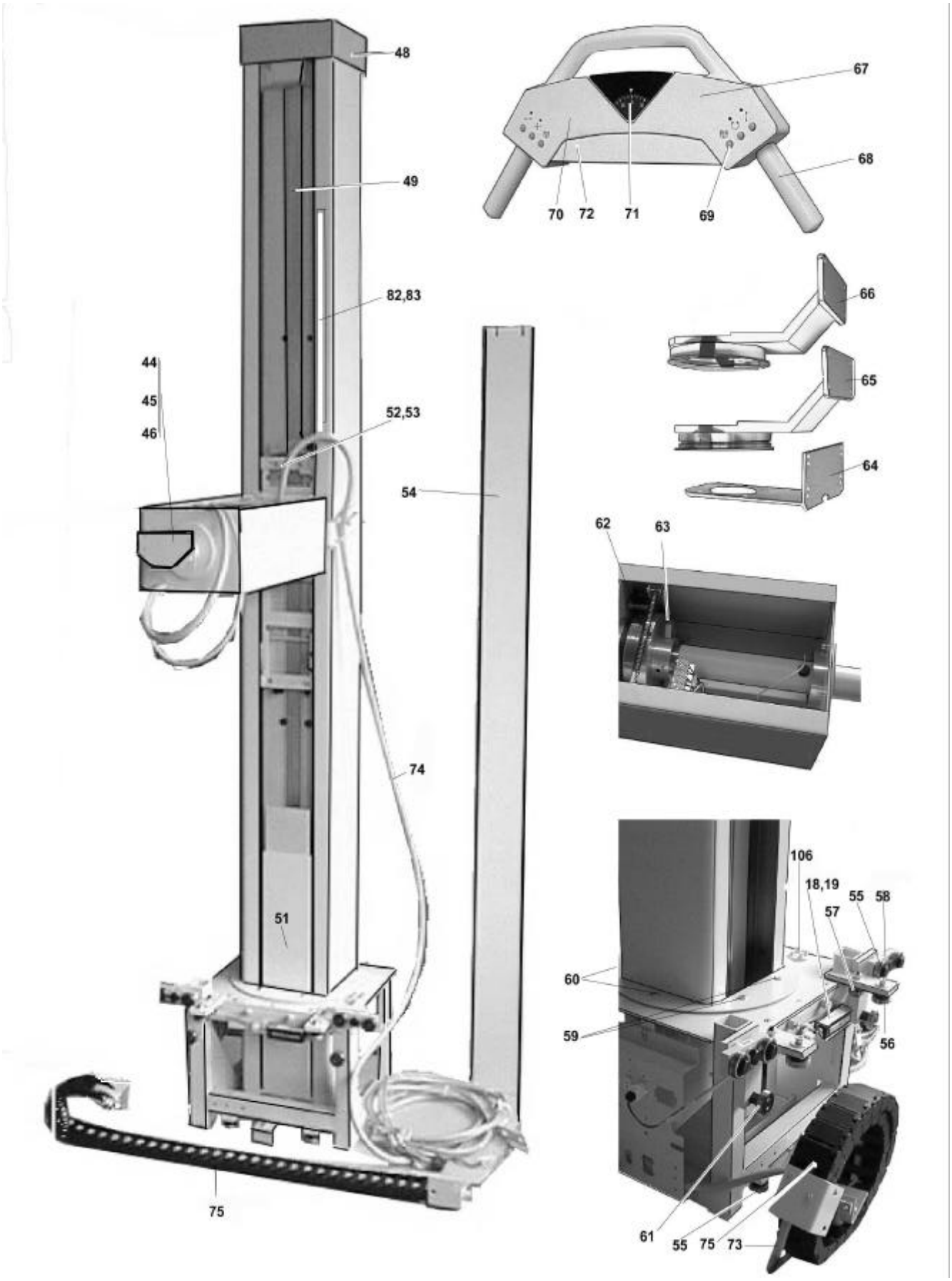
4.2.1 Spare Parts Column sheet 1



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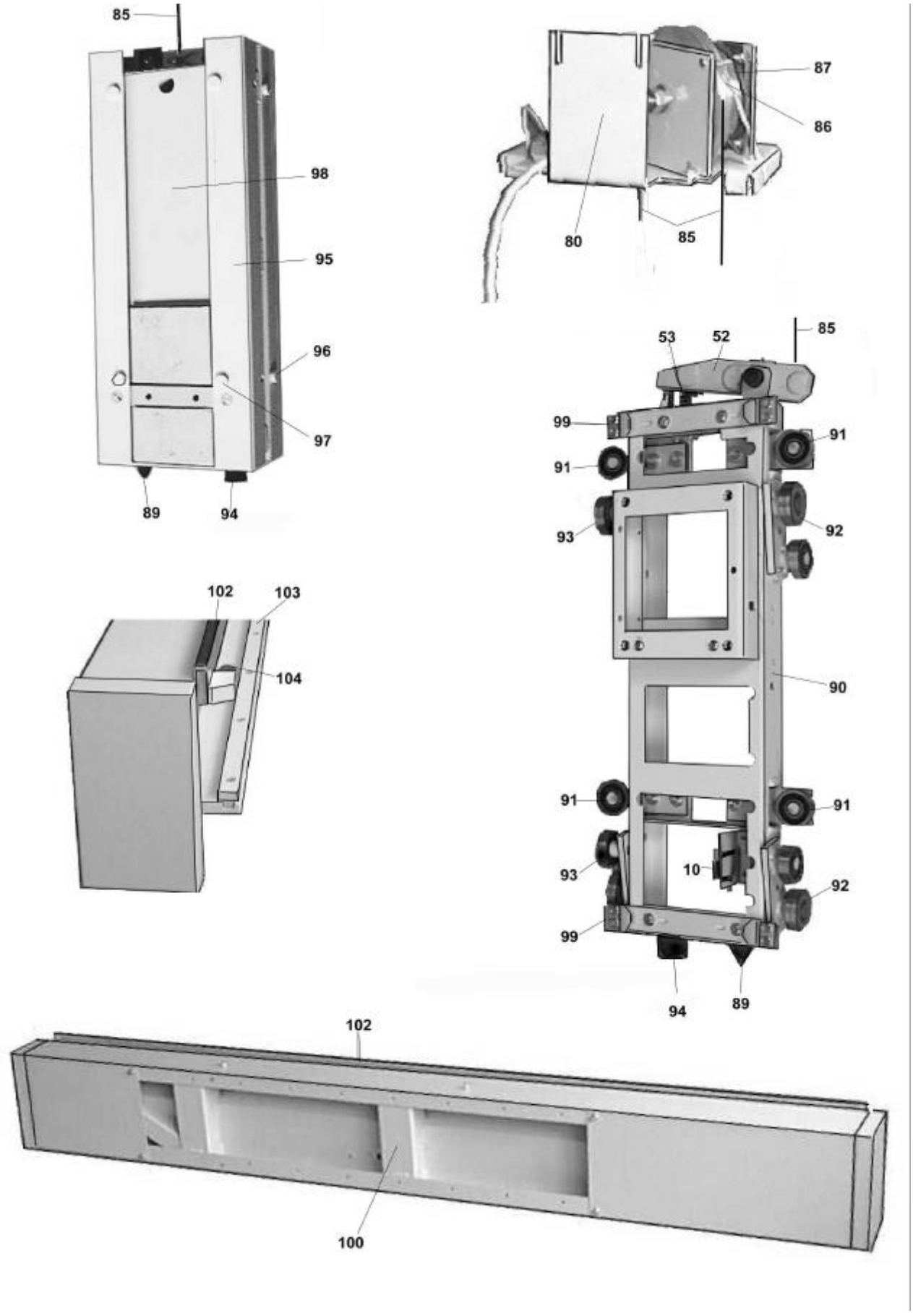
4.2.1 Spare Parts Column sheet 2



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4.3 Spare Parts List

Description / Order No.

Note:
Defective parts must only be replaced by genuine spare parts as listed below. When ordering please always specify the serial number of the unit and the full order number of the part.
Parts or part assemblies may only be replaced by the manufacturer or parties expressly authorised. See also chapter on *„Safety Procedures“.*

Pos.	Description	Order-No.
1	Table top complete	0622 0540a
2	Table top frame	0622 0541
3	Table top	0622 0548
4	Profile rails	0622 0549
5	Stop	0622 0550a
6	Stop	0622 0550b
7	Bumper	0005 0164g
8	Power supply	0006 0449
9	Capacitor	3110 0028
10	Switch	0006 0184
11		
12	Bridge plug	0632 0306
13		
14	Fuse plug 1,6A	0006 0308b
15	Fuse plug 3,2A	0006 0308g
16	Fuse plug 10A	0006 0308k
17		
18	Laminated spring	0632 0418
19	Brake solenoid	0006 0603
20		
21	Guide pulley	0632 0420
22	Eccentric	0632 0421
23		
24	Bumper	0005 0108
25	Bumper support	0622 0620
26	Bearing with eccentric	0622 0555
27		
28	Bearing with bushing	0622 0556
29	Guide pulley	0632 0422
30	Bearing	2400 0013
31	Bearing	0005 0191a
32	Eccentric axis	0632 0659
33	Bearing axis	0632 0657
36	Button	0006 0720a
37	Switch	0006 0079a
38	Catch lever	0322 0637b
39	Catch lever	0322 0637a

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Pos.	Description	Order-No.
40	Switch lever	0006 0450
41	Trough complete	0632 0160
42	Pedal	0632 0125
43	Eccentric axis	0632 0610
44	Tube support arm 100 mm	0125 0815a
45	Tube support arm 127 mm	0125 0815b
46	Tube support arm GE	0125 0815d
47	Tube support arm Toshiba	0125 0815e
48	Head piece weld	0125 0580
49	Strip	0125 0550
50	Tube saddle	0125 0780
51	Cover bottom	0370 0138
52	Spring	0005 0159
53	Safety brake II	0125 0733
54	Cover top	0125 0570
55	Bearing with bolt	0125 0374
56	Bearing with eccentric	0125 0369a
57	Bearing with bushing	0125 0369b
58	Bolt	0125 0383
59	Bearing with bolt	0125 0376
60	Bearing with eccentric	0125 0377
61	Bearing with eccentric	0125 0373
62	Solenoid bracket	0006 0687
63	Detent quick release ass.	0125 0880
64	Control housing	0322 0629
65	Control housing	0322 0270
66	Control housing	0322 0273
67	Control handle assembly	0125 1000a
68	Handle	0125 1008
69	Button	
70	Print board	0125 1020
71	Angle indicator	0125 1010
72	Table measure	0125 1019
73	Cable table	0125 1607a
74	Cable column	0125 1606
75	Timing Belt	0006 0686
76	Spring	0005 0042f
77	Pulley	0322 0118
78		
79		
80	Column top assembly	0125 0650
81		
82	Scale cm	0008 0106
83	Scale inch	0008 0107
84		
85	Wire rope	0125 0662
86	Wire rope pulley	0125 0659
87	Solenoid bracket	0323 0555
88		
89	Parabolic spring	0005 0103a

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Pos.	Description	Order-No.
90	Vertical carriage	0125 0701
91	Sole plate	0125 0725
92	Bearing balance	0125 0720a
93	Bearing balance	0125 0720b
94	Bumper	0005 0164h
95	Counterweight	0125 0601b
96	Glide block	0125 063
97	Glide block	0125 063
98	Weight plate	0125 0623
99	Profile	0370 0137
100	Rail assembly	0125 0115
101		
102	Rail	0125 0202
103	Floor guide rail	0125 0136
104	Stop	0125 0137
105		
106	Detent quick release ass.	0125 0340
107		
108	Catch	0125 1243
109		
110	Coupling assembly	0125 1210
112	Switch	0006 0184
113	Wiper	0322 0131
114	Guide for wiper	0322 0130

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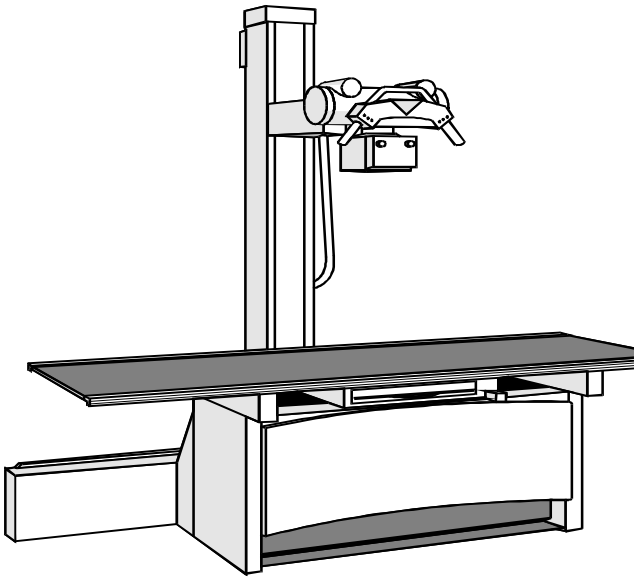
Name Plate Location:



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4.5 Maintenance Certificate

The maintenance according to the attached maintenance instructions has been carried out. Any parts replaced were original spare parts as shown on the list.

Replaced parts (List item no. only)

Date Name of company Signature

Replaced parts (List item no. only)

Date Name of company Signature

Replaced parts (List item no. only)

Date Name of company Signature

Replaced parts (List item no. only)

Date Name of company Signature

Subject to technical alterations TV/Ru

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